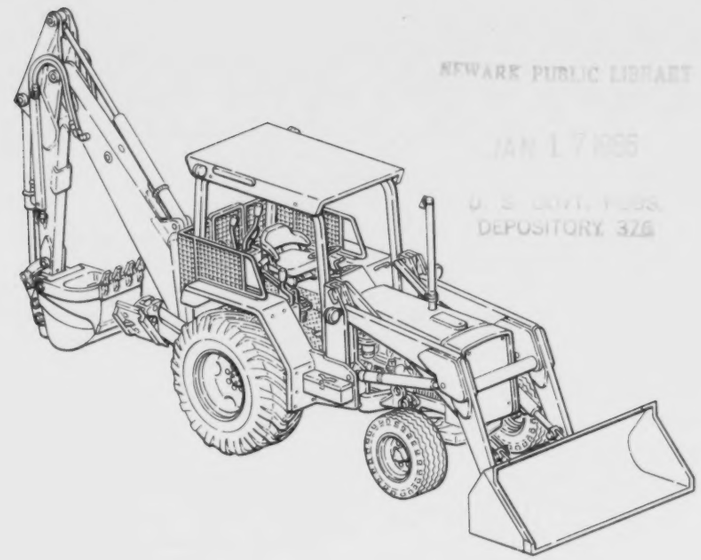
5-2420-222-10

TM 5-2420-222-10

TECHNICAL MANUAL

OPERATOR'S MANUAL



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TRACTOR, WHEELED (DED) LOADER BACKHOE W/HYDRAULIC IMPACT TOOL AND W/HYDRAULIC EARTH AUGER ATTACHMENT JOHN DEERE MODEL JD 410 (CCE) W/WAIN-ROY BUCKET, HUGHES IMPACTOR AND DANUSER EARTH DRILL (NSN 2420-00-567-0135)

HEADQUARTERS, DEPARTMENT OF THE ARMY
DECEMBER 1985

DTIC
READER

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

WARNING

NUCLEAR, BIOLOGICAL, OR CHEMICAL EXPOSURE

After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double-lined plastic bags and swiftly moved to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination, however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when draining fuel filter sediment bowl. Failure to observe these precautions could cause serious injury or death.

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

WARNING

Read all operating instructions in this section completely before operating loader backhoe. Failure to follow these instructions could cause serious injury or death.

WARNING

Hearing protection must be worn when operating loader backhoe. Failure to observe this precaution could cause hearing loss.

WARNING

CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU

Carbon monoxide is without color or smell, but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when loader backhoe engine is operated for any purpose.

- DO NOT operate loader backhoe engine in a closed place unless the place has a lot of moving air.

- BE ALERT at all times during loader backhoe operation for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY VENTILATE. If symptoms persist, remove affected crew to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

- BE AWARE; the field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

WARNING

Ether is highly flammable. Be careful when using ether starting aid. If ether discharger is being used for testing, demonstration, or other purposes and is not installed on the engine, do not use in closed spaces or near an open flame. Failure to observe these precautions could cause serious injury or death.

WARNING

Keep parking brake engaged during warmup to prevent loader backhoe from rolling. Failure to observe this precaution may result in serious injury or death.

WARNING

Downshift only one gear at a time. Under coasting conditions, do not downshift until tachometer indicates 800 rpm or less. Personal injury may result due to sudden reduction in loader backhoe speed if an improper shift is made.

WARNING

Reverse speeds are 16 per cent faster than forward speeds. Be careful when shifting or traveling in reverse. Personal injury may result due to sudden change in direction of loader backhoe when speed has been increased.

WARNING

Brake pedal lock should be left in locked position when traveling at high speeds or on open road. If brakes are applied, and brake pedal lock is unlocked, braking action will be for one side only, and could cause serious injury to personnel.

WARNING

Keep parking brake lever in applied position at all times when loader backhoe is parked to prevent loader backhoe from rolling and causing injury to personnel.

WARNING

Avoid coasting loader backhoe. Coasting reduces stability and drivability. Failure to observe this precaution could cause injury to personnel.

WARNING

Do not tow loader backhoe faster than 15 mph (24 km/h). Loader backhoe may become difficult to steer and control. Failure to observe this warning could cause personal injury and damage to equipment.

WARNING

Avoid contact with inner coil of cigar lighter element. Coil is extremely hot. Failure to observe this precaution could cause serious burns.

WARNING

Do not test fire extinguisher. Partial discharge could make a fire extinguisher useless in an emergency. Replace a discharged fire extinguisher as soon as possible.

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

WARNING

Be careful when raising stabilizers. Remember that stabilizers may be the only support preventing loader backhoe from rolling into excavation. If loader backhoe rolls over, serious injury or death to personnel can result.

WARNING

Do not operate backhoe with speed gear assembly (reverser) control lever in the reverse position. If gearshift lever is accidentally bumped, loader backhoe can accelerate quickly causing operator to lose control. Failure to observe this precaution can cause serious injury to personnel.

WARNING

When operating earth auger and connecting and disconnecting auger hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

WARNING

When operating hydraulic impactor and connecting and disconnecting impactor hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

WARNING

Keep all personnel clear of working area during lift. Slings could break and cause serious injury and death.

WARNING

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when checking fuel level or filling fuel tank. Be sure that fuel pump or container nozzle contacts fuel tank filler neck to carry off static electricity. Crew member will stand by with fire extinquisher while loader backhoe is being filled with fuel. Failure to observe these precautions could cause an explosion resulting in serious injury or death.

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Use a rag to cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take it off of radiator.

WARNING

Electrolyte and battery corrosion can cause injury to you. Wear safety goggles and gloves. If for any reason electrolyte or battery corrosion contacts the eyes, skin or clothing, flush immediately with large amounts of cool water and seek medical attention immediately.

WARNING

Avoid contact with live steam. Life steam can burn skin, cause blindness, and cause other serious injury. Be sure to wear protective apron, gloves, and safety goggles when using live steam.

TECHNICAL MANUAL
NO. 5-2420-222-10

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. *12 December 1985*

OPERATOR'S MANUAL

TRACTOR, WHEELED (DED)
LOADER BACKHOE
W/HYDRAULIC IMPACT TOOL AND
W/HYDRAULIC EARTH AUGER ATTACHMENT
JOHN DEERE MODEL JD 410 (CCE)
W/WAIN-ROY BUCKET, HUGHES IMPACTOR
AND DANUSER EARTH DRILL
(NSN 2420-00-567-0135)

CURRENT AS OF JUNE 1985

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms), or DA Form 2028-2 located in the back of this manual directly to: Commander, U.S.Army Tank-Automotive Command, ATTN: AMSTA-MB, Warren, MI 48397-5000. A reply will be sent to you.

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*This manual supersedes operator's portion of TM 5-2420-222-14&P1 and TM 5-2420-222-14&P2, dated October 1982, including all changes.

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HOW TO USE THIS MANUAL

This manual is designed to help you operate and maintain the loader backhoe. The front cover table of contents is provided for quick reference to important information. There is also an index located in the final pages for use in locating specific items of information.

Measurements in this manual are given in both US standard and metric units. A metric to US standard conversion chart can be found on the inside back cover.

Read all preliminary information found at the beginning of each task. It has important information and safety instructions you must follow before beginning the task.

Warning pages are located in the front of this manual. You should learn warnings before doing maintenance on equipment.

A subject index appears at the beginning of each chapter listing sections that are included in that chapter. A more specific subject index is located at beginning of each section to help you find exact paragraph you're looking for.

CHAPTER 1

INTRODUCTION

OVERVIEW

This chapter contains information on forms and records, and other standard data you may need to refer to during operation and maintenance of the loader backhoe. It also provides you with general information and identifies and describes major components and systems of the loader backhoe.

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Section I. GENERAL INFORMATION

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Equipment Improvement Report and Maintenance Digest (EIR MD)	1-2	Loader Backhoe	1-1
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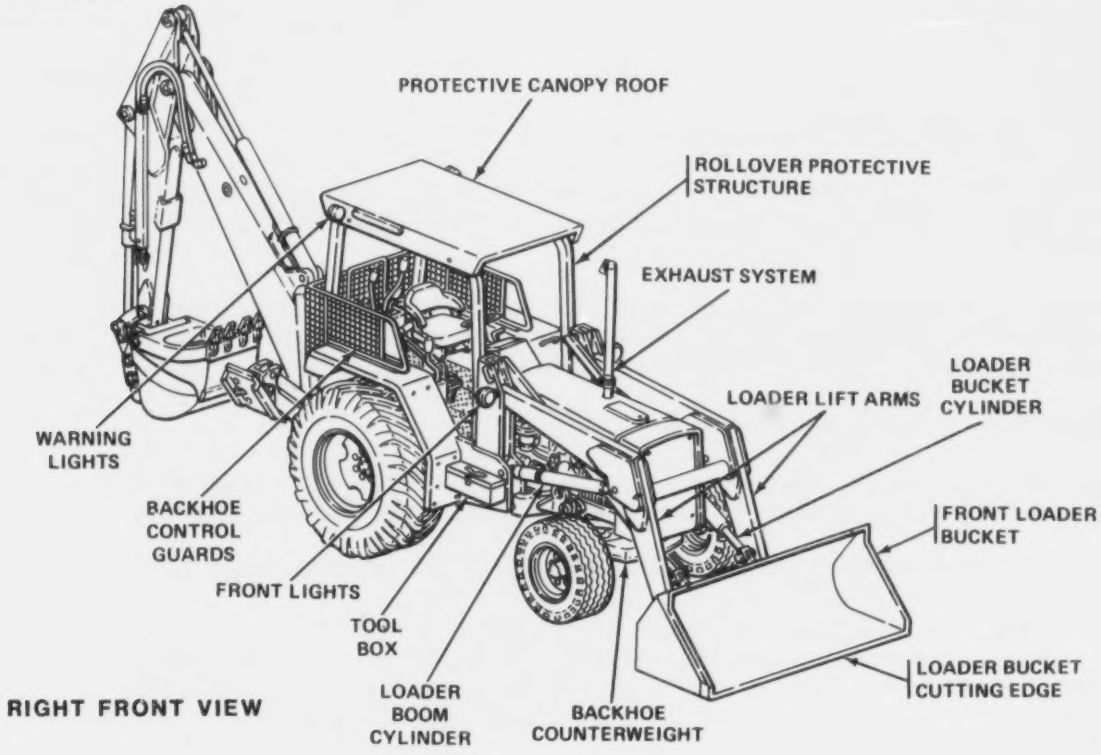
LOADER BACKHOE



RIGHT FRONT VIEW

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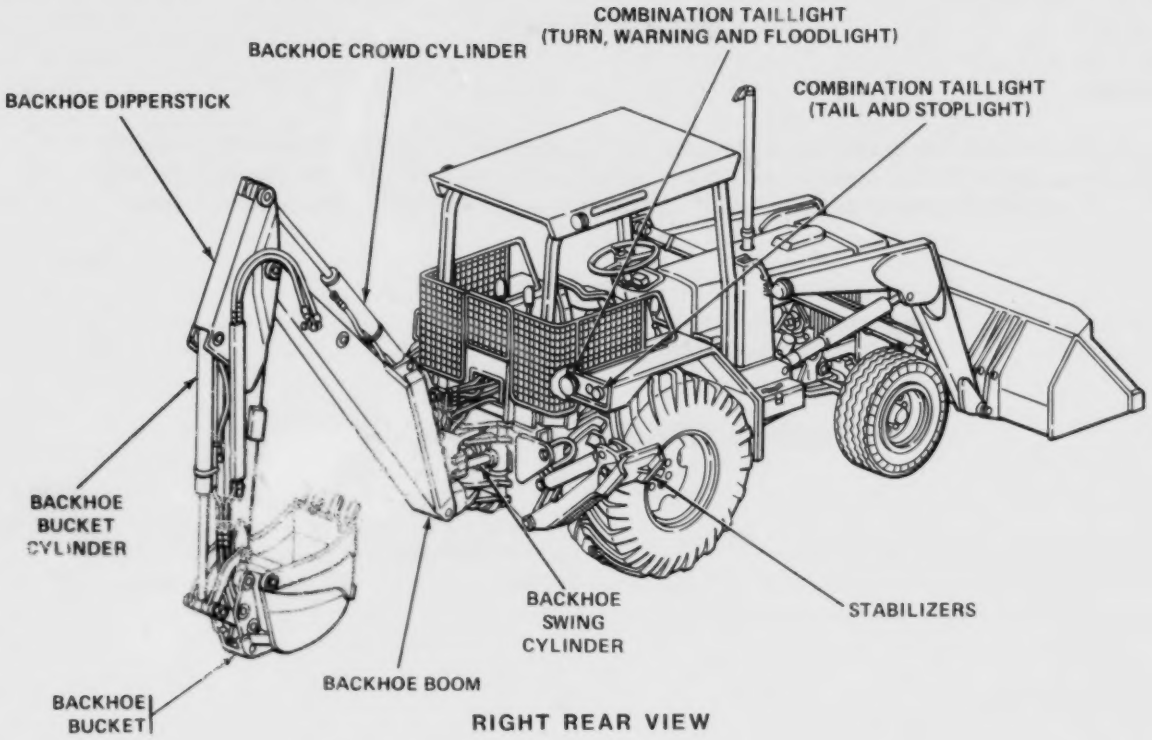
LOADER BACKHOE – CONTINUED



RIGHT REAR VIEW

SCOPE

Type of Manual: Operation and Operator's Maintenance.

Model Number and Equipment Name: John Deere Model JD 410 Wheeled Tractor Loader Backhoe with Hydraulic Impact Tool and Hydraulic Earth Auger Attachment (Short Item Name: Loader Backhoe).

Purpose of Equipment: Excavation for pipelines, building footings, drainage ditches and fortification, stockpiling, loading, transferring stockpiled materials, backfilling, rock and concrete breaking, tamping, asphalt cutting, earth boring and post driving.

MAINTENANCE FORMS AND RECORDS

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD)

If your loader backhoe needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-Automotive Command, ATTN: AMSTA-MP, Warren, MI 48397-5000. We'll send you a reply.

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EQUIPMENT IMPROVEMENT REPORT AND MAINTENANCE DIGEST (EIR MD) – CONTINUED

The Quarterly Equipment Improvement Report and Maintenance Digest, TB 43-0001-41 series, contains valuable field information on the equipment covered in this manual. The information in the TB 43-0001-41 series is compiled from some of the Equipment Improvement Reports that you prepared on the vehicles covered in this manual. Many of these articles result from comments, suggestions, and improvement recommendations that you submitted to the EIR program. The TB 43-0001-41 series contains information on equipment improvements, minor alterations, proposed Modification Work Orders (MWO's), warranties (if applicable), actions taken on some of your DA Form 2028's (Recommended Changes to Publications), and advance information on proposed changes that may affect this manual. The information will help you in doing your job better and will help in keeping you advised of the latest changes to this manual. Also refer to DA PAM 310-1 Consolidated Index of Army Publications and Blank Forms, and Appendix A, References, of this manual.

Section II. EQUIPMENT DESCRIPTION

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EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

TYPE OF EQUIPMENT

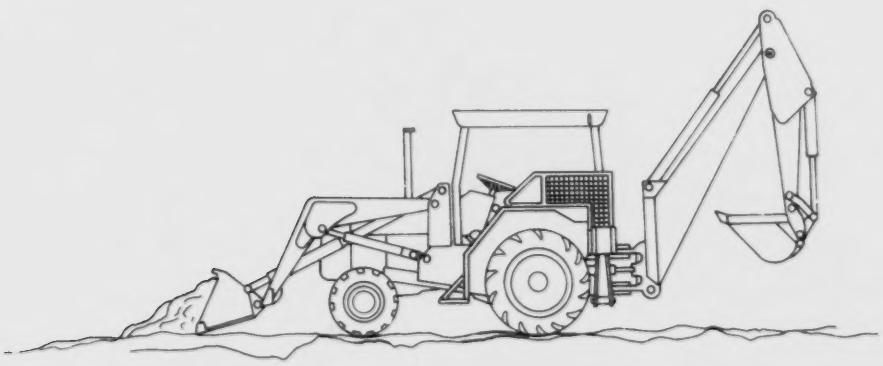
Excavating, Earthmoving Construction

Characteristics/Features

Self-propelled
Diesel powered
Speed gear assembly (reverser)
Individual right hand side and left hand side brakes for tight steering
Differential lock for added traction
Light materials loader bucket
Heavy-duty jaw backhoe bucket
Hydraulic impactor tool
Hydraulic earth auger

Capabilities

Bulldozes and Spreads



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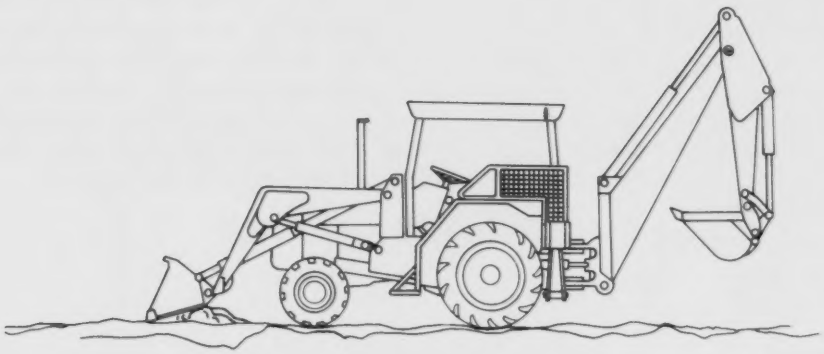
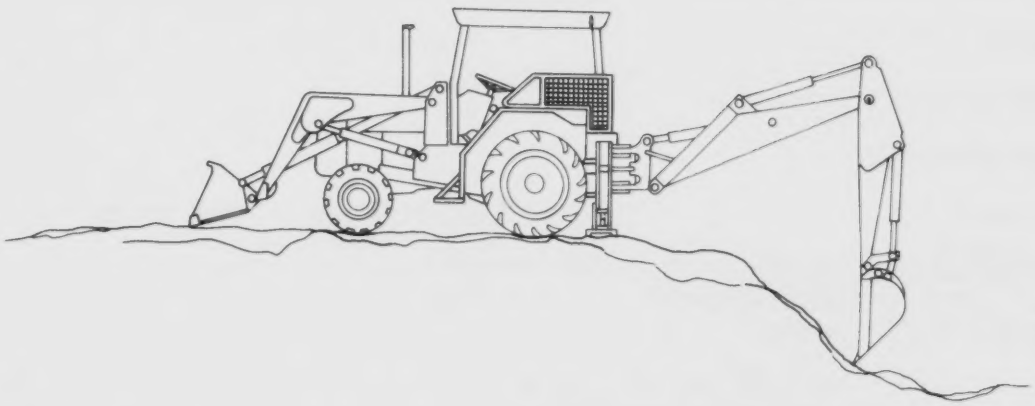
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES – CONTINUED

CAPABILITIES – CONTINUED

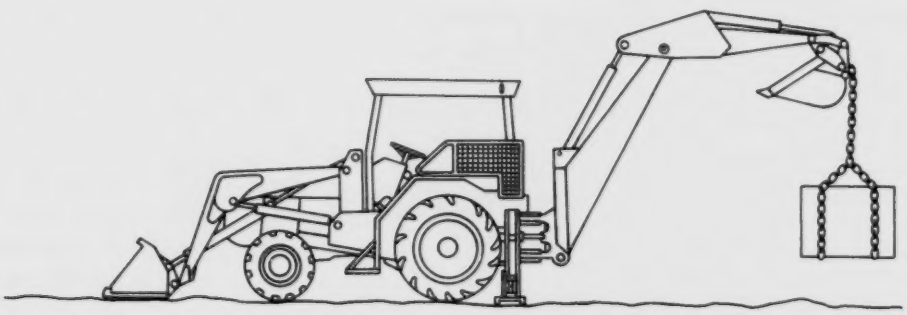
Levels, Grades, and Backfills



Excavates and Digs



Lifts Heavy Loads



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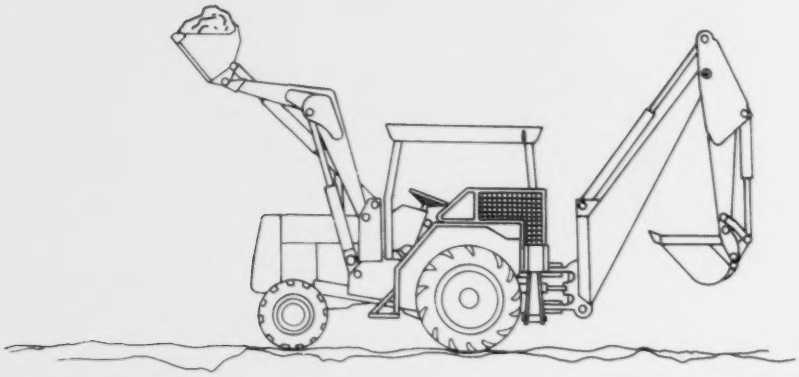
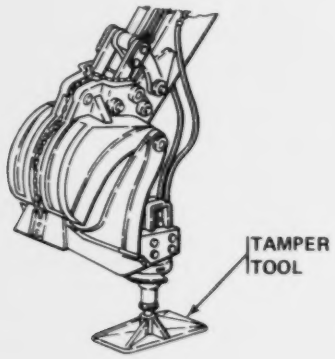
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES – CONTINUED

CAPABILITIES – CONTINUED

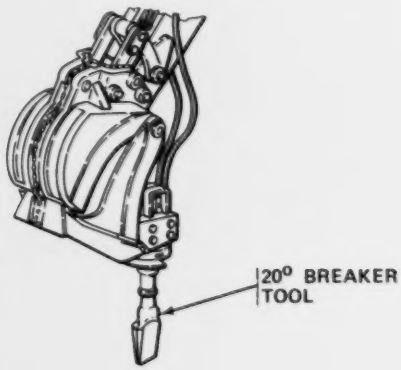
Loads



Tamps (Tamper Tool)



Breaks Concrete and General Rock (20° (0.35 rad) and 30° (0.53 rad) Breaker Tools)



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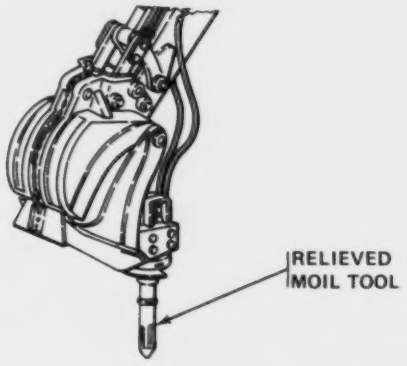
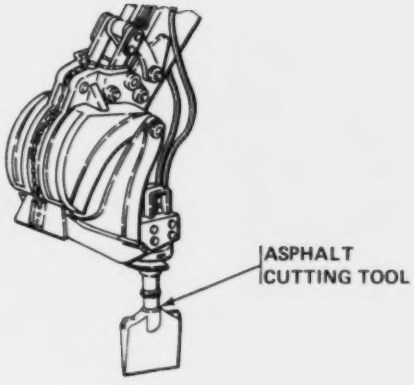
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES – CONTINUED

CAPABILITIES – CONTINUED

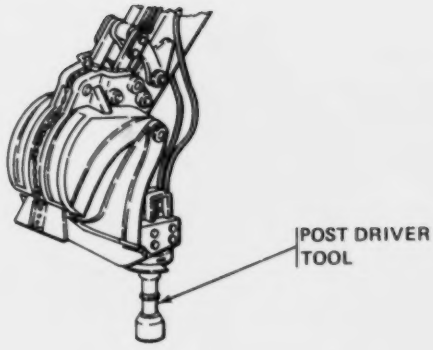
Breaks Hard Rock and Concrete (Relieved Moil Tool)



Cuts Asphalt (Asphalt Cutting Tool)



Drives Posts (Post Driver Tools)



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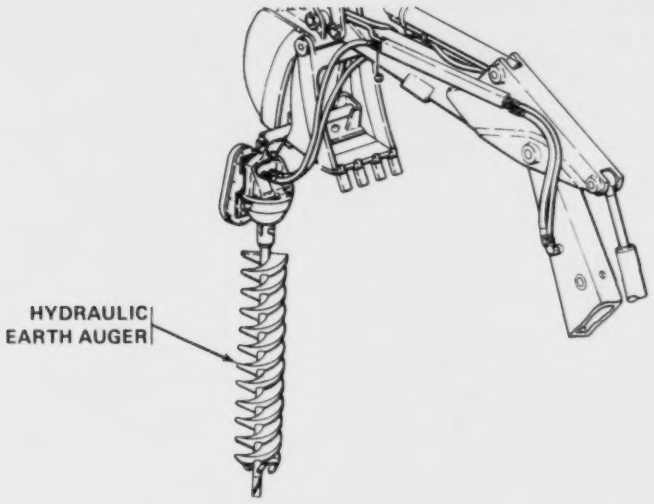
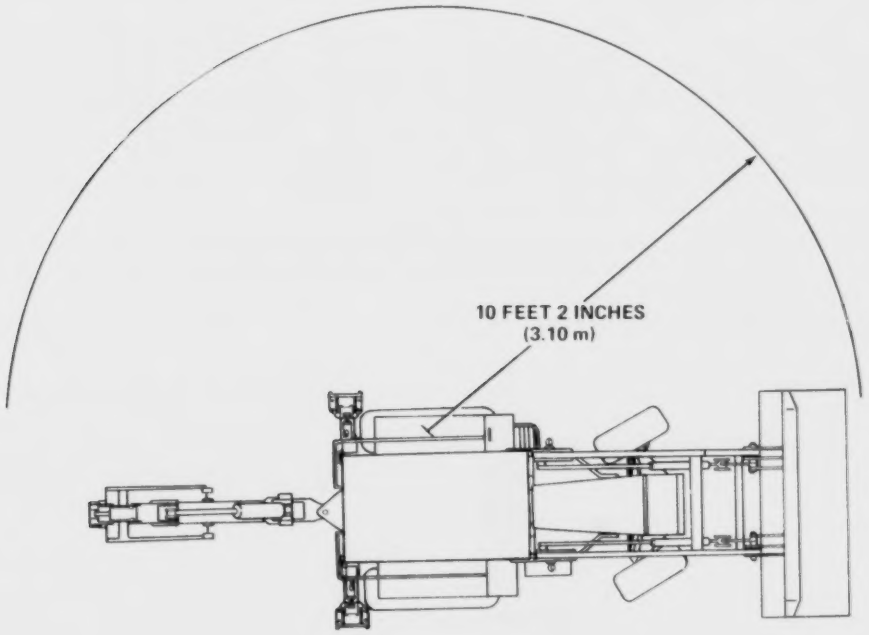
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES – CONTINUED

CAPABILITIES – CONTINUED

Drills



Minimum Turning Radius (Brake Applied) – 10 feet 2 inches (3.10 m)



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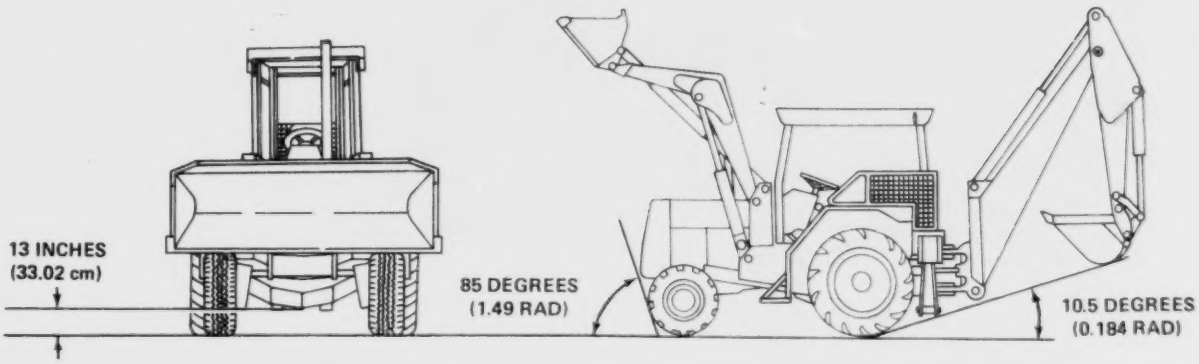
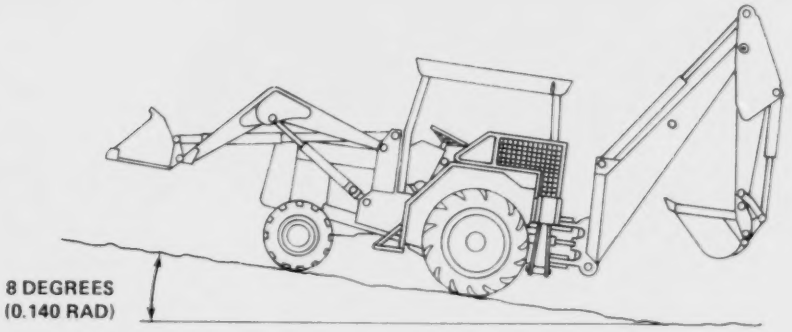
EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES – CONTINUED

CAPABILITIES – CONTINUED

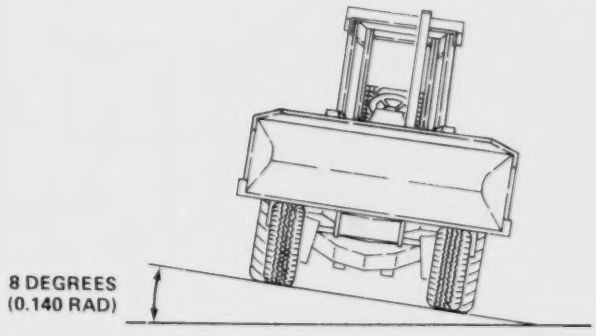
Angle of Approach – 85 degrees (1.49 rad)
Angle of Departure – 10.5 degrees (0.184 rad)
Ground Clearance – 13 inches (33.02 cm)



Maximum Grade – 8 degrees (0.140 rad)



Maximum Side Slope – 8 degrees (0.140 rad)



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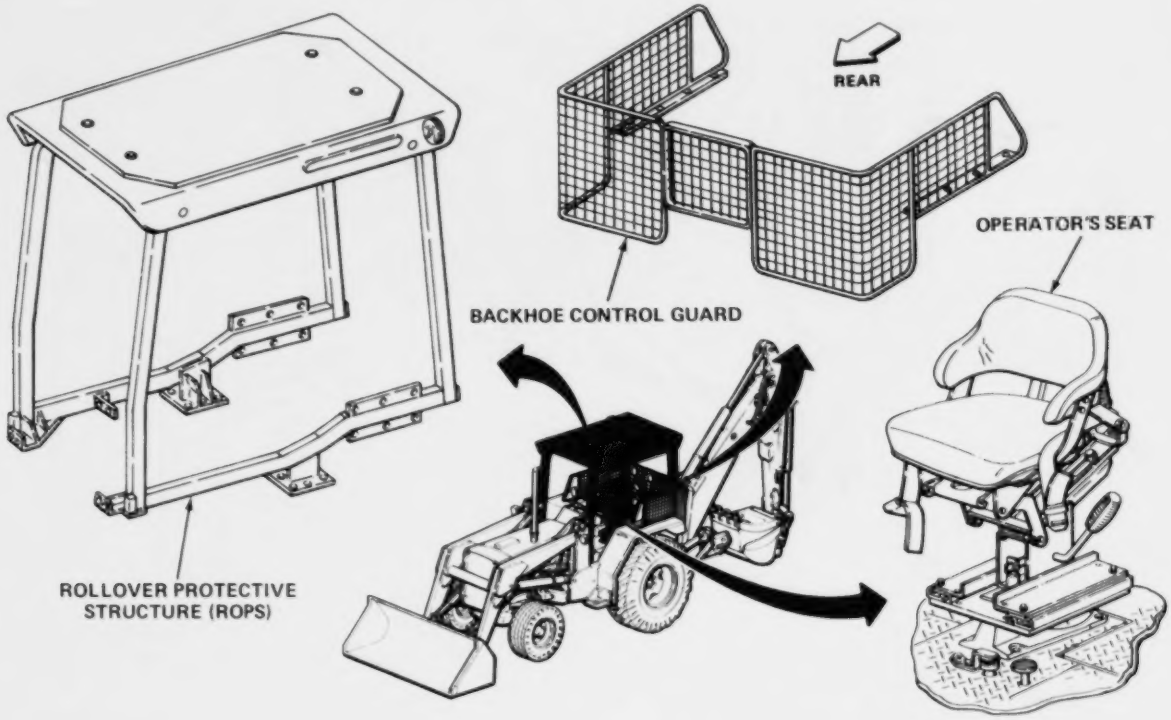
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS



ROLLOVER PROTECTIVE STRUCTURE (ROPS)

- Consists of heavy welded steel frame bolted to loader backhoe frame.
- Protects operator if loader backhoe rolls over.

BACKHOE CONTROL GUARD

- Consists of steel frame with welded fence bolted to loader backhoe fenders.
- Protects operator from falling debris during backhoe operation.

OPERATOR'S SEAT

- Consists of fully padded bucket seat with spring loaded base mounted to the center of the cab floor.
- Absorbs some of the shock produced during operation, reducing operator fatigue.
- Swivels from front to back for driving/loading or backhoe operation.

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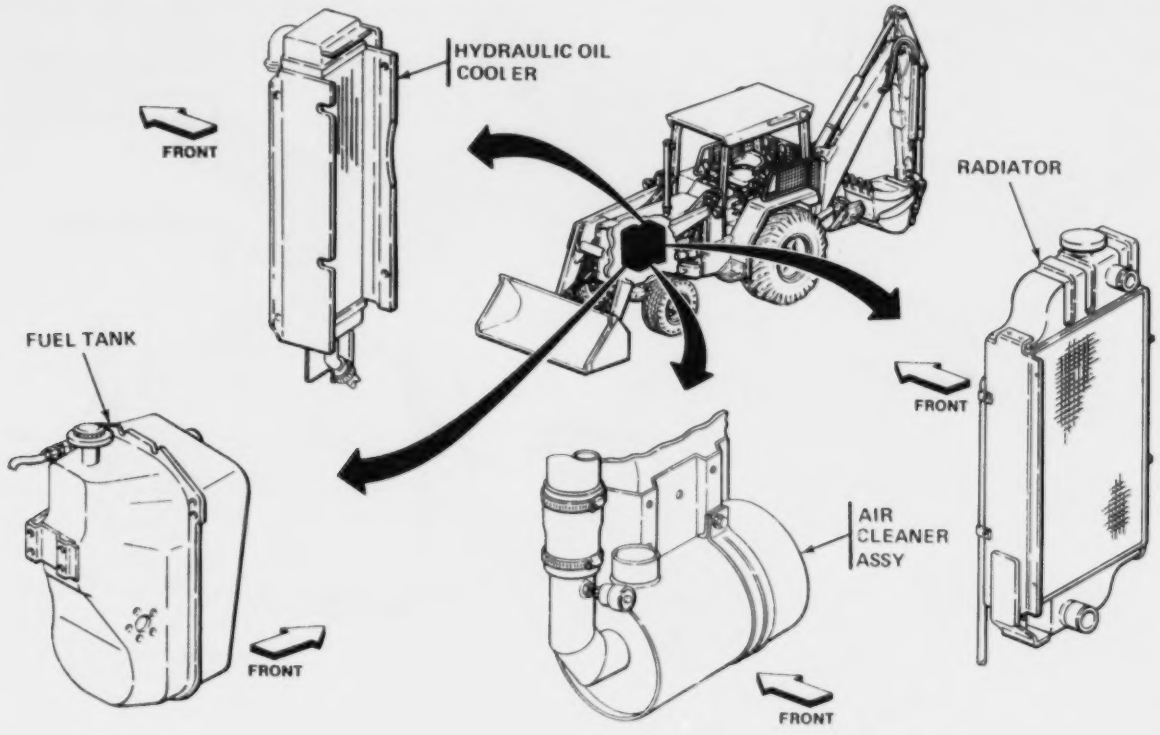
LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



RADIATOR

- Consists of finned core with top and bottom tanks mounted to front frame in front of engine.
- Keeps engine temperature within safe operating range.

HYDRAULIC OIL COOLER

- Consists of finned core mounted to right of radiator.
- Cools hydraulic system oil.

FUEL TANK

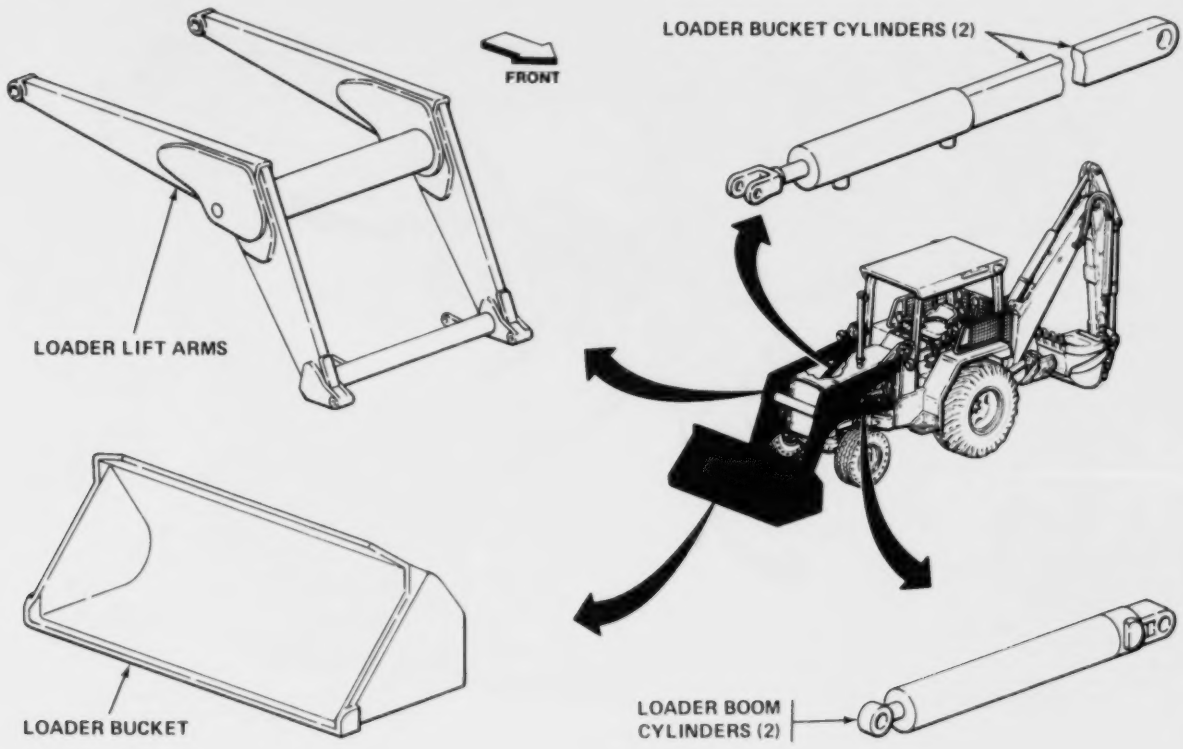
- Consists of welded steel tank mounted in front of radiator and air cleaner assembly.
- Provides clean storage of diesel fuel for engine.

AIR CLEANER ASSEMBLY

- Consists of dry filter element housed in air cleaner body, mounted in front of radiator.
- Contamination indicator mounted on air cleaner body elbow shows all red in sight window when air cleaner needs to be serviced.
- Keeps dirt out of engine, fuel, and air systems.

TA234800

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



LOADER BUCKET

- Consists of welded panels and cutting edge. Attached at bottom of right and left loader lift arms, and to right and left loader bucket cylinders.
- Used for leveling, grading, and loading.

LOADER BUCKET CYLINDERS (2)

- Consists of two hydraulic cylinders, one attached to each loader side frame at one end, and loader bucket at other end.
- Dumps or retracts loader bucket while bottom pivots at lift arms.

LOAD BOOM CYLINDERS (2)

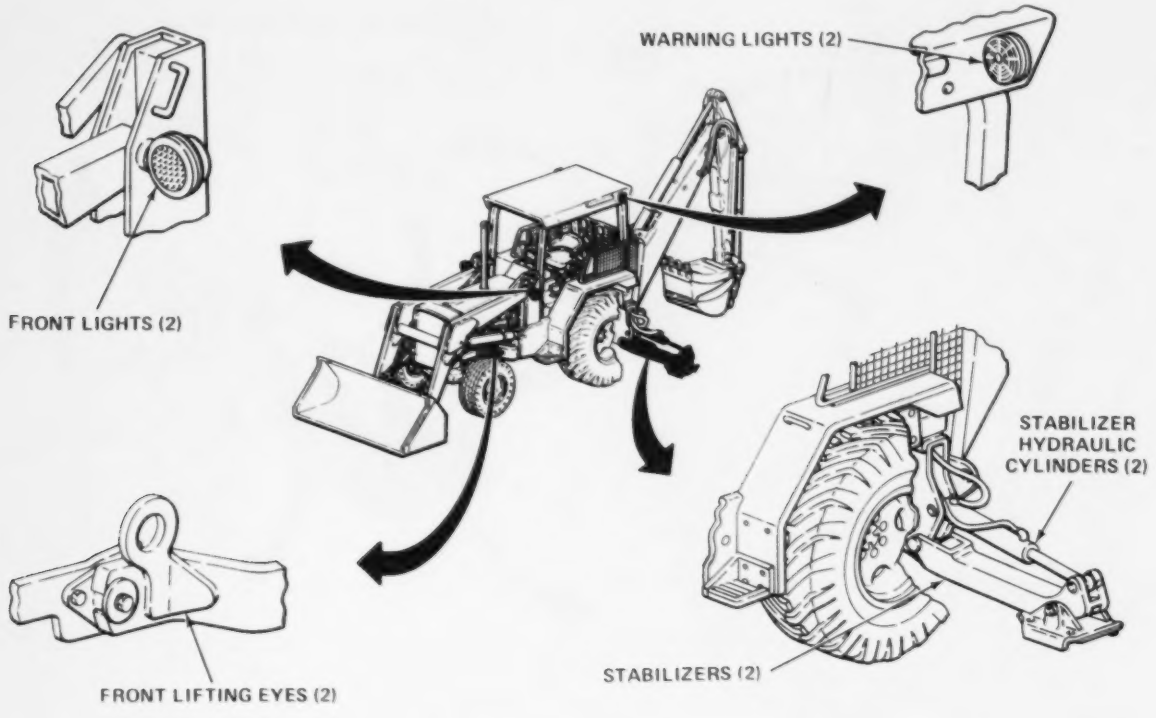
- Consists of two hydraulic cylinders, one attached to each loader side frame at one end, and loader lift arms at other end.
- Raises and lowers loader lift arms and loader bucket.

LOADER LIFT ARMS

- Consists of heavy constructional steel plates and tubes, mounted to loader boom cylinders and loader bucket, and pivots at upper loader side frames.
- Raises and lowers loader bucket.

TA234801

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



FRONT LIGHTS (2)

- Consists of two sealed beam floodlight lamps, one mounted on each side of loader side frames.
- Lights up wide area of worksite in front of loader backhoe during loader night operations.

WARNING LIGHTS (2)

- Consists of two warning lights mounted on ROPS canopy.
- Provides warning and directional marking when turn signals are applied.

STABILIZER HYDRAULIC CYLINDERS (2)

- Consists of two hydraulic cylinders, one attached to each side of rear main frame at one end and stabilizer and foot at other end.
- Raises and lowers stabilizers.

STABILIZERS (2)

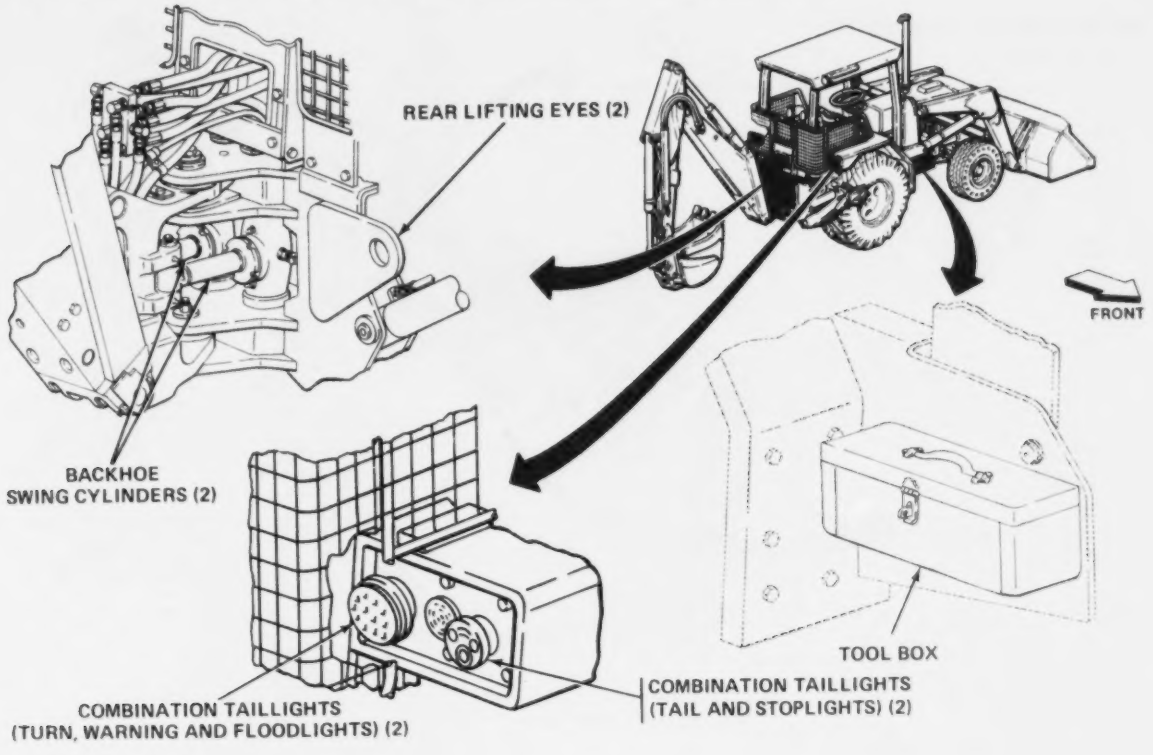
- Consists of stabilizer and foot, one attached to each side of rear main frame.
- When lowered, lifts and stabilizes loader backhoe during backhoe operation.

FRONT LIFTING EYES (2)

- Consists of two heavy steel eyes, one welded to each side of loader side frame.
- Provides attachment points for chains and cables to lift front of loader backhoe.

TA234802

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



TOOL BOX

- Consists of removable steel box with hinged lid mounted to right side of cab.
- Provides storage area for tools and publications needed for operation of loader backhoe.

COMBINATION TAILLIGHTS (TAIL AND STOP LIGHTS) (2)

- Consists of two taillight assemblies mounted on rear fenders.
- Provides rear marking during night operation and indicate stop when brakes are applied.

COMBINATION TAILLIGHTS (TURN, WARNING, AND FLOODLIGHTS) (2)

- Consists of two floodlight assemblies mounted on rear fenders.
- Lights up wide area of worksite behind loader backhoe during backhoe night operations, also flash with turn indicator and warning lights.

REAR LIFTING EYES (2)

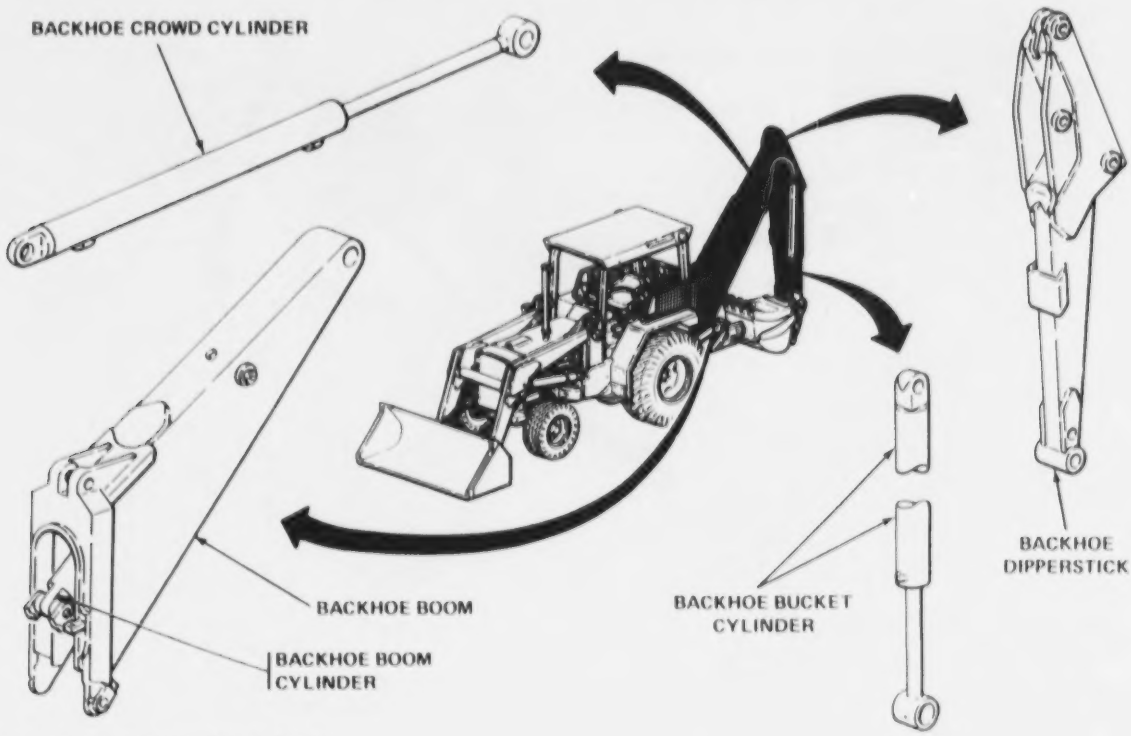
- Consists of two heavy steel eyes, one welded to each side of rear frame.
- Provides attachment points for chains and cables to lift rear of loader backhoe.

BACKHOE SWING CYLINDERS (2)

- Consists of two hydraulic cylinders, one attached to each side of backhoe boom at one end and rear frame at other end.
- Moves backhoe boom from right to left.

TA234803

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



BACKHOE CROWD CYLINDER

- Consists of hydraulic cylinder attached to backhoe boom and backhoe dipperstick.
- Raises and lowers dipperstick.

BACKHOE DIPPERSTICK

- Attached to backhoe boom and backhoe crowd cylinder at one end and backhoe bucket at other end.
- Main digging arm of backhoe.

BACKHOE BUCKET CYLINDER

- Consists of hydraulic cylinder attached to backhoe dipperstick at one end and backhoe bucket at other end.
- Tilts backhoe bucket forward and back.

BACKHOE BOOM CYLINDER

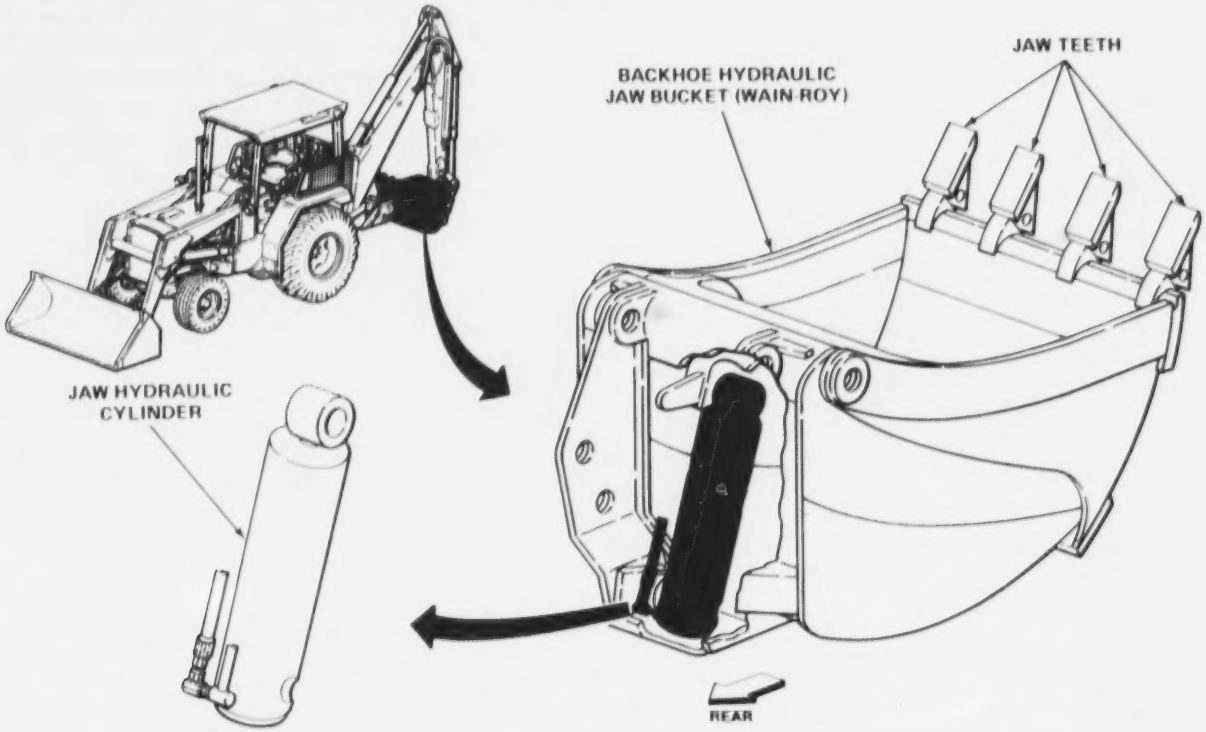
- Consists of hydraulic cylinder attached to backhoe swing frame at one end and inside of backhoe boom at other end.
- Raises and lowers backhoe boom.

BACKHOE BOOM

- Attached to backhoe swing frame at one end, and backhoe dipperstick at other end.
- Supported by two backhoe swing cylinders and backhoe boom cylinder.

TA234804

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



BACKHOE HYDRAULIC JAW BUCKET (WAIN-ROY)

- Consists of inner bucket and jaw, hinged together at top, with hydraulic cylinder to open or close jaw from inside cab of loader backhoe.
- Mounted at end of backhoe dipperstick, bucket can be used for excavation of pipelines, building footings and drainage ditches, lifting heavy objects, and scarifying.
- Backhoe hydraulic jaw bucket used with backhoe loader attachments, supported between bucket and jaw, can also be used for rock and concrete breaking, tamping, asphalt cutting, earth boring and post driving.

JAW TEETH

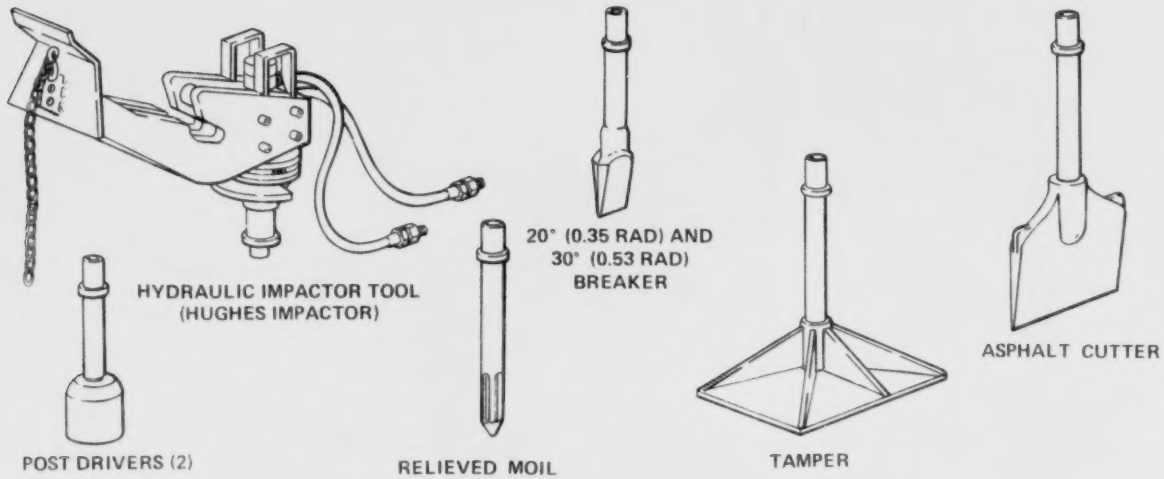
- Consists of four pins and teeth mounted to scarifier shanks along bottom edge of backhoe hydraulic jaw bucket.
- Used to break up hard surfaces.

JAW HYDRAULIC CYLINDER

- Consists of hydraulic cylinder attached to inside base of bucket at one end and upper cross support of jaw at other end.
- Opens and closes bottom of jaw while top pivots on bucket hinges.

TA234805

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



HYDRAULIC IMPACT TOOL (HUGHES IMPACTOR)

- Consists of impact tool, adapter plates, and main bracket with hydraulic lines and couplings. Mounted to backhoe hydraulic jaw bucket.
- Hydraulic impact tool is a high energy impact device which uses loader backhoe hydraulic power source to deliver rapid powerful blows to top of working tool.
- Hydraulic impact tool comes with seven working tools.

TAMPER

- Consists of hardened steel shaft and 14.125-inch x 20-inch (35.878 cm x 50.8 cm) foot.
- Used for compaction of backfilled areas or loose dirt.

20° (0.35 rad) AND 30° (0.53 rad) BREAKER

- Each consist of hardened steel shaft with 2.3125-inch (5.8737 cm) cutting edge.
- Used for general rock and concrete breaking respectively.

RELIEVED MOIL

- Consists of hardened steel shaft with finned end bit.
- Used for concrete and hard rock breaking respectively.

ASPHALT CUTTER

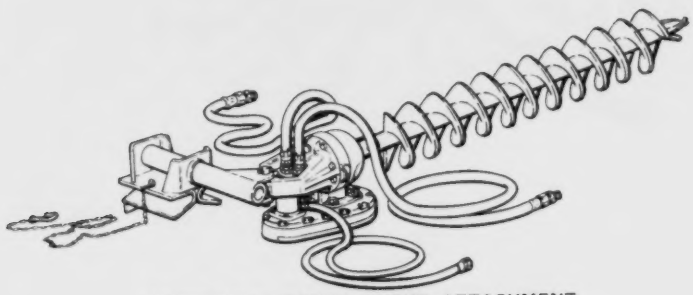
- Consists of hardened steel shaft with 12-inch (30.5 cm) cutting edge end bit.
- Used for cutting asphalt to a predetermined line.

TA234806

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED

POST DRIVERS (2)

- Consists of hardened steel shaft with either 3-inch (7.6 cm) or 4-inch (10.2 cm) inside diameter end bits.
- Used for driving 3-inch (7.6 cm) or 4-inch (10.2 cm) diameter post in vertical or horizontal position.



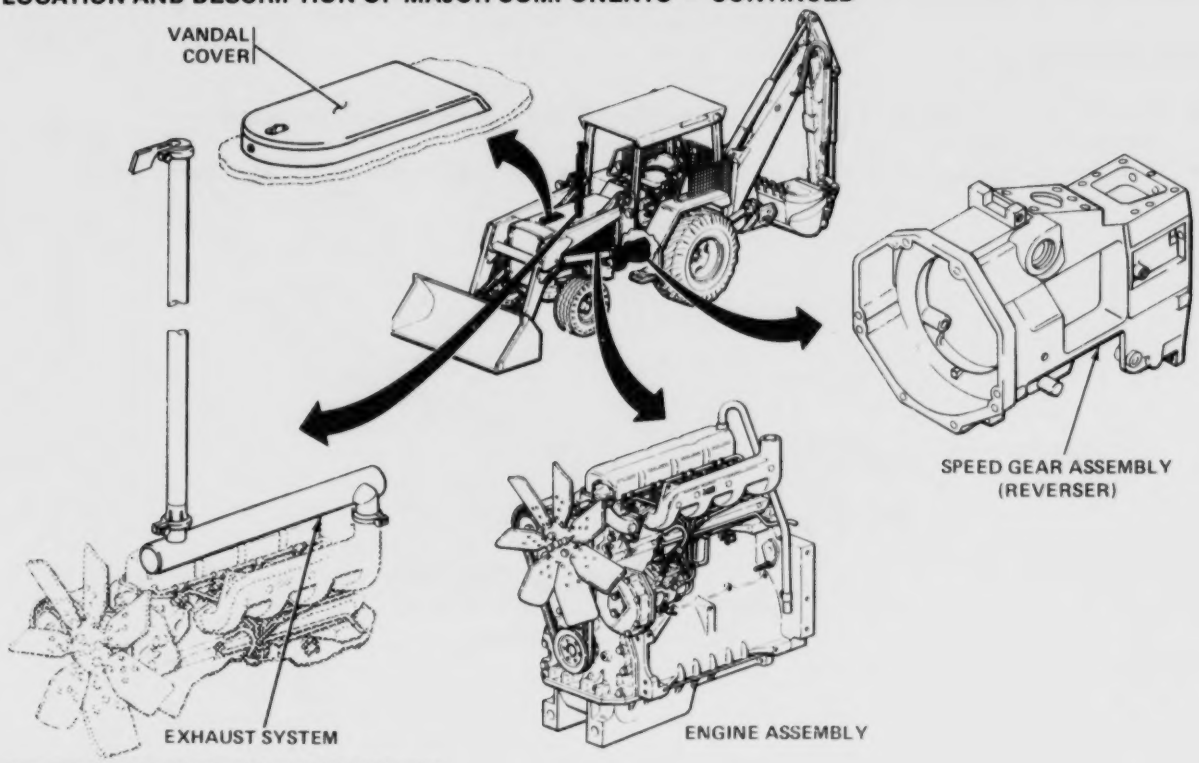
HYDRAULIC EARTH AUGER ATTACHMENT
(DANUSER EARTH DRILL)

HYDRAULIC EARTH AUGER ATTACHMENT (DANUSER EARTH DRILL)

- Consists of boring head motor, adapter tube, adapter bracket, auger, and hydraulic lines and fittings. Mounted to backhoe hydraulic jaw bucket.
- Hydraulic earth auger attachment hydraulic motor is connected to a spider and pinion gear through chain drive. Capable of drilling in loose ground, such as sand, or sticky ground, such as clay.
- The earth auger attachment is hydraulically powered. One main advantage is that direction of rotation can be quickly reversed.

TA234807

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



SPEED GEAR ASSEMBLY (REVERSER)

- Consists of single compound planetary set of gears, reverse brake, and one clutch.
- A hydraulic and mechanical device which changes direction of loader backhoe travel under full load without shifting transmission gears.
- Loader backhoes with Serial Numbers 235786 thru 235999, have high-speed lockout which will not allow reverser shifting while main transmission is in "high" range (5th gear or above).
- Loader backhoe with Serial Numbers 319995 thru 342573 do not have high-speed lockout and will allow reverser shifting while main transmission is in "high" range (5th gear or above).

ENGINE ASSEMBLY

- Consists of four cylinder, in-line diesel engine and accessories.
- Provides power for loader backhoe drive train and for electrical and hydraulic systems.

EXHAUST SYSTEM

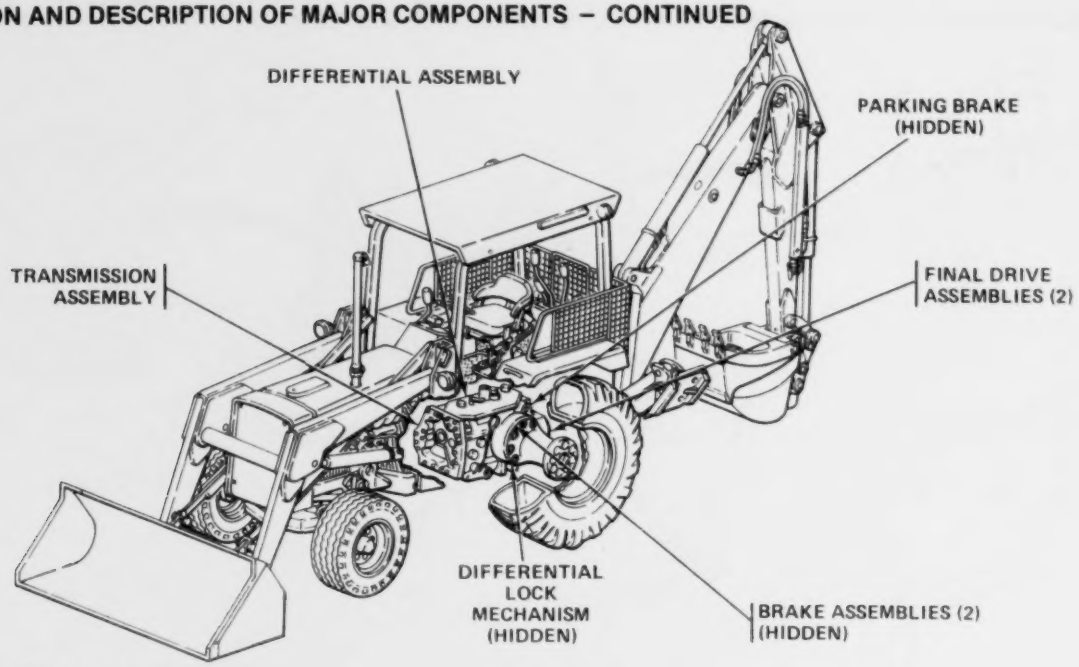
- Consists of muffler and exhaust pipes attached to engine exhaust manifold.
- Reduces exhaust noise and routes exhaust gases up, over cab.

VANDAL COVER

- Consists of hinged door and welded metal body mounted to top of hood by four screws, above radiator and fuel tank filler caps.
- Capable of being locked. Provides protection against vandalism to contents of radiator and fuel tank.

TA234808

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



DIFFERENTIAL ASSEMBLY

- Consists of spiral bevel gear assembly, located within transmission and differential case.
- Transmits power from transmission to final drive assemblies.

PARKING BRAKE

- Consists of parking brake drum and lining, located within the differential case.
- Locks drive train inside differential to keep loader backhoe from moving when parked.

FINAL DRIVE ASSEMBLIES (2)

- Consists of planetary pinion carrier, housing and rear axle shaft.
- Transmits final 5-to-1 speed reduction from differential to rear wheels.

BRAKE ASSEMBLIES (2)

- Consists of brake disc and plate located between final drive housing and differential case.
- Increased friction between stationary plate and rotating disc slows loader backhoe when brakes are applied.

DIFFERENTIAL LOCK MECHANISM

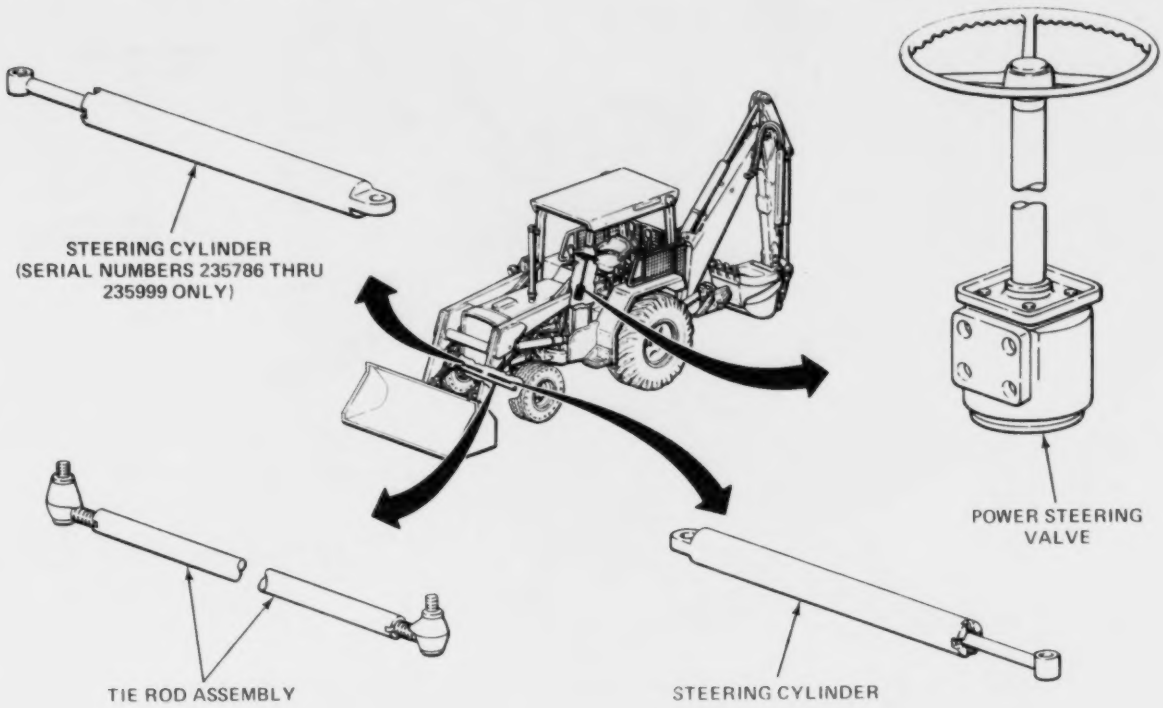
- Consists of a sliding collar and linkage which locks gears and pinions within differential.
- When engaged, this gives the effect of a slipless, solid rear axle.

TRANSMISSION ASSEMBLY

- Consists of three main shafts with gears and shifting shafts, located within differential case.
- Determines eight speed ranges, four low speeds and four high speeds.

TA234809

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



POWER STEERING VALVE

- Consists of rotary spool and sleeve assembly located inside the valve housing with a gerotor at the end of the assembly.
- Determines direction and rate of hydraulic oil flow to steering cylinder(s). Controlled by shaft from steering wheel.

STEERING CYLINDER(S)

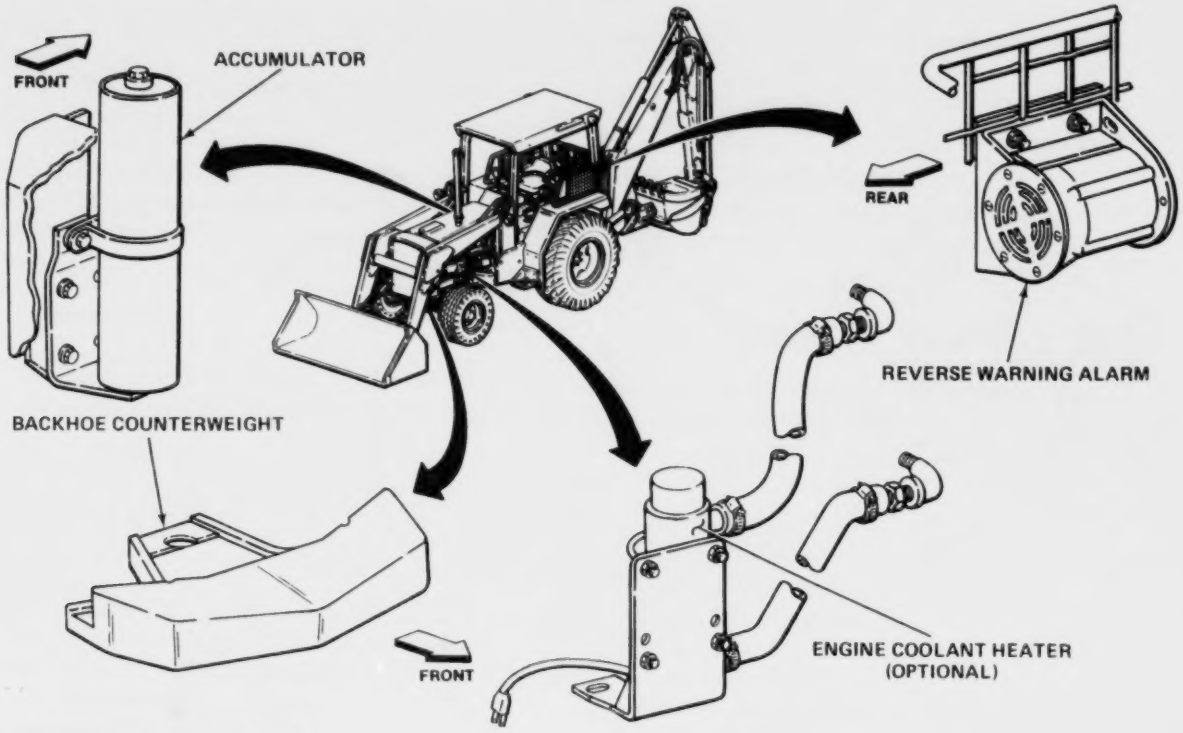
- Consists of hydraulic cylinder attached to front frame at one end and steering arm on spindle at other end. Connected to steering valve by hydraulic lines.
- Provides turning force by pushing or pulling on steering arm, depending on direction.
- Some loader backhoes may have two steering cylinders, one on each side, depending on serial number. If loader backhoe has only one steering cylinder, it will be on the left side of loader backhoe.

TIE ROD ASSEMBLY

- Consists of steel rod, adjustable in length, with ball sockets at each end. Connects to steering arms at each side of loader backhoe.
- Transmits and equalizes steering force to both front wheels.

TA234810

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



REVERSE WARNING ALARM

- Consists of alarm and reverse warning alarm switch. Reverse warning alarm is located on left backhoe control guard above the fender.
- Sounds alarm whenever loader backhoe is operated in reverse. Alarm has adjustable switch for low, medium, and high volume.

ENGINE COOLANT HEATER (OPTIONAL)

- Consists of heater, mounting bracket, hoses, and adapters located on engine lower left side.
- Allows easy starting in extreme cold when 1000-watt, 115-volt heater is connected to 115-volt power supply ten hours before starting.
- Not all loader backhoes have engine coolant heaters. Engine coolant heaters can be adapted to loader backhoe when used in extremely cold climate.

BACKHOE COUNTERWEIGHT

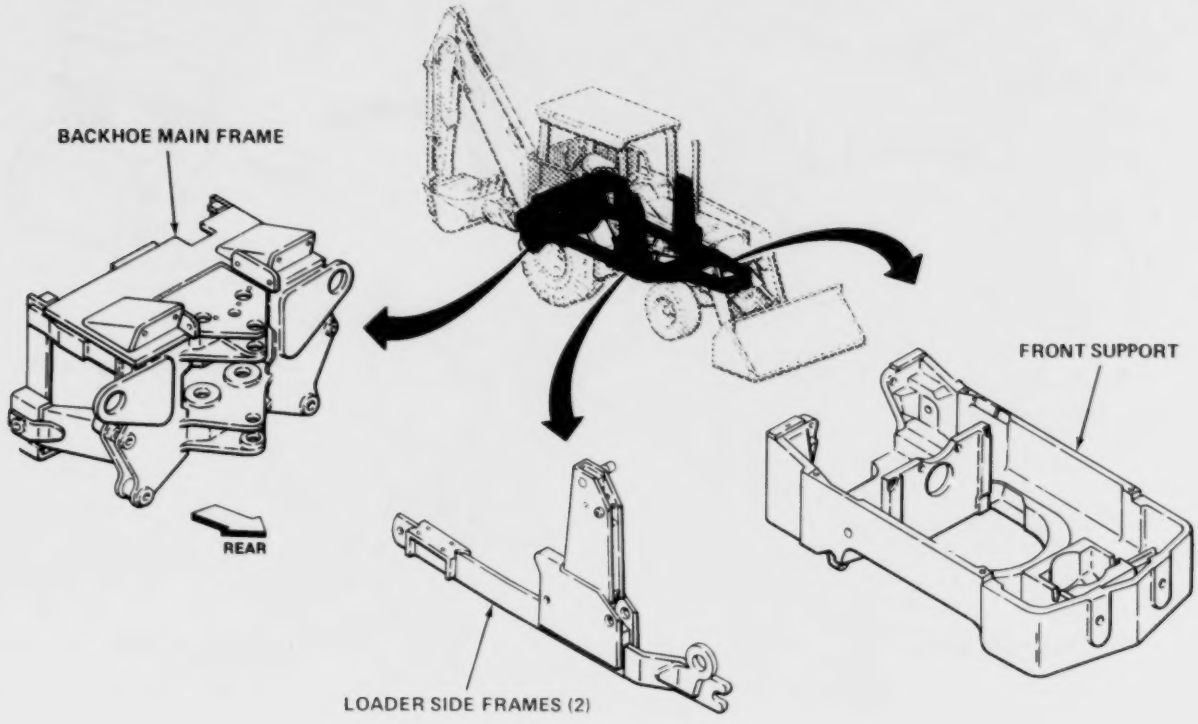
- Consists of heavy steel weight and U-bolts mounted to front axle.
- Adds stability by counteracting weight of backhoe when driving or during backhoe operation.

ACCUMULATOR

- Consists of small cylinder with piston. Accumulator is filled with nitrogen gas to specified pressure on one side of piston, and other side is filled with hydraulic oil from main pump.
- Acts as a buffer to reduce surges in hydraulic system. Supplies system with oil and pressure as pump starts to stroke when loader backhoe is first started, and just after loader backhoe engine is stopped.

TA234811

LOCATION AND DESCRIPTION OF MAJOR COMPONENTS – CONTINUED



BACKHOE MAIN FRAME

- Consists of heavy steel plates and castings, welded into single unit. Connected to loader side frames by tapered pins.
- Provides rigid base for mounting backhoe components and stabilizers.

LOADER SIDE FRAMES (2)

- Consists of heavy steel rails and plates, welded into single unit. Connected to backhoe main frame by tapered pins, and front support by pivot pins.
- Provides rigid base for mounting, differential, final drive, and loader components.

FRONT SUPPORT

- Consists of heavy steel rails, plates, and castings welded together to form single unit. Bolted to engine and connected to loader side frames by pivot pins.
- Provides rigid base for mounting of loader backhoe front components and engine.

TA234812

DIFFERENCES BETWEEN MODELS

Although all models of loader backhoes covered by this manual have the same model number, there are differences in configuration. Differences in equipment depend on loader backhoe serial number. There are two basic serial number breaks, numbers 235786 thru 235999 and 319995 thru 342573. These two designs differ mostly in transmission design and hydraulic line routing.

Throughout this manual, where differences in configuration or equipment affect operation or maintenance, they are shown in detail. If differences are minor or obvious, such as differences in exact appearance or location, and operation and maintenance are not affected, typical equipment is shown.

EQUIPMENT DATA

Equipment and performance data for loader backhoe and major components are listed below and on the following pages in tabular format. All weights and measures are approximate.

LOADER BACKHOE

Manufacturer	John Deere
Model	JD 410
Weight	15,000 lb (6,810 kg)
Overall length (transport position)	286 in. (726.44 cm)
Overall width (less loader bucket)	84.5 in. (214.63 cm)
Height (to top of exhaust pipe)	104 in. (264.16 cm)
Ground clearance	13 in. (33.02 cm)
Turning radius	122 in. (309.88 cm)
Angle of approach	85° (1.49 rad)
Angle of departure	10.5° (0.184 rad)
Maximum grade	8° (0.140 rad)
Maximum side slope	8° (0.140 rad)

ENGINE

Number of cylinders	4
Type of engine	Valve in head, in-line cylinder
Cycle	4
Bore	4.02 in. (10.2 cm)
Stroke	4.33 in. (11.0 cm)
Piston displacement	219 cu in (3,588 cu cm)
Compression ratio	16.2 to 1
Firing order	1-3-4-2
Rotation	Clockwise
Rated horsepower (at 2500 rpm)	
Gross (without fan)	66 hp (49.2 kw)
Net (with fan)	62 hp (46.2 kw)
Minimum compression reading	350 psi (2,413.25 kPa)
Maximum variation in compression	50 psi (344.75 kPa)
Maximum torque (at 1,300 rpm)	160 lb-ft (217 Nm)
Number of main bearings	5
Low idle speed	800-825 rpm
High idle speed	
Hand throttle	2,650 rpm
Foot throttle	2,800 ± 50 rpm

EQUIPMENT DATA – CONTINUED

ENGINE – CONTINUED

Cooling	Liquid-pressurized with thermostat and fixed by-pass
Lubrication	Pressure system with full-flow filter
Fuel	Diesel fuel oil
Fuel consumption	2.5 gal (9.5 liters) per hour
Fan	Suction
Air cleaner	Dry
FUEL TRANSFER PUMP	
Type	Diaphragm with hand primer lever
ELECTRICAL SYSTEM	12-Volt, negative ground
AC GENERATOR	
Type	35 AMP
BATTERIES	
Quantity	2
Volt	6
Cold cranking AMP's	830 AMP's at 0°F (-17.8°C)
Reserve capacity	340 minutes at 25 AMP's
ENGINE CLUTCH	Automotive, foot-operated with 10 in. (25.4 cm) plate
TRANSMISSION (Serial No. 235786 thru 235999)	
Forward gears	8
Reverse gears	4
Type	Standard shift with hydraulic direction reverser
TRANSMISSION (Serial No. 319995 thru 342573)	
Forward gears	8
Reverse gears	8
Type	Standard shift with hydraulic direction reverser
FINAL DRIVES	
Type	Inboard, planetary
Speed reduction	5-to-1
BRAKES	Fully enclosed wet-disk, foot operated individually or simultaneously, hydraulic
TIRES	
Front	
Quantity	2
Size	11L-16

EQUIPMENT DATA – CONTINUED

TIRES – CONTINUED

Ply rating	10
Type	F3
Inflation	48 psi (331 kPa)
Rear	
Quantity	2
Size	18.4-24
Ply rating	8
Type	R4
Inflation	22 psi (152 kPa)

WHEEL TREADS

Front	61 in. (155 cm)
Rear	66 in. (163 cm)

HYDRAULIC SYSTEM

Type	Closed-center
Maximum Pressure	2,350 psi (16,203 kPa)
Loader control	Single lever
Backhoe control	Two lever
Pump	
Type	Piston, constant pressure
Displacement	Variable, 38 gpm (144 L/m) at 2.500 engine rpm
Filter	25 micron steel enclosed paper cartridge in return

HYDRAULIC CYLINDERS

Loader boom (2)	
Bore	3.25 in. (8.3 cm)
Stroke	28.7 in. (72.9 cm)
Rod diameter	1.75 in. (4.4 cm)
Loader bucket (2)	
Bore	3.25 in. (8.3 cm)
Stroke	16.7 in. (42.4 cm)
Rod diameter	1.50 in. (3.8 cm)
Backhoe boom	
Bore	4.5 in. (11.4 cm)
Stroke	36.75 in. (93.2 cm)
Rod diameter	2.25 in. (5.7 cm)
Backhoe crowd	
Bore	4.5 in. (11.4 cm)
Stroke	35.5 in. (90.2 cm)
Rod diameter	2.25 in. (5.7 cm)
Backhoe bucket	
Bore	3.5 in. (8.9 cm)
Stroke	27.37 in. (69.5 cm)
Rod diameter	2.25 in. (5.7 cm)

EQUIPMENT DATA – CONTINUED

HYDRAULIC CYLINDERS – CONTINUED

Backhoe swing (2)	
Bore	4.0 in. (10.2 cm)
Stroke	9.31 in. (23.6 cm)
Rod diameter	1.75 in. (4.4 cm)
Stabilizer (2)	
Bore	3.5 in. (8.9 cm)
Stroke	16.94 in. (42.9 cm)
Rod diameter	1.75 in. (4.4 cm)

LOADER

Rollback at ground level	40° (.698 rad)
Breakout force	7,500 lb (33,360 N)
Digging depth below ground level (with bucket level)	4 in. (10.2 cm)
Lifting capacity, full height	5,000 lb (2,268 kg)
Height to bucket hinge pin	129 in. (328 cm)
Maximum dump angle	50° (.873 rad)
Clearance, bucket dumped at 45° (.785 rad)	102 in. (259 cm)
Reach at maximum height, bucket dumped at 45° (.785 rad)	33 in. (83.8 cm)
Raising time to full height	4.6 sec
Bucket dump time	1.3 sec
Lowering time (power)	2.9 sec

BACKHOE

Digging depth	
Maximum	184 in. (467 cm)
24 in (61 cm) flat bottom	182 in. (462 cm)
96 in (244 cm) flat bottom	170 in. (432 cm)
Swing arc	180° (3.14 rad)
Lifting capacity	
Boom at full reach and full height	1,950 lb (884 kg)
Dipper lifting, boom holding, full height	3,300 lb (1,497 kg)
Digging force (bucket cylinder in power-dig position)	9,650 lb (42,923 N)
Digging force, crowd cylinder	7,158 lb (31,838 N)
Reach from center of swing mast	224 in. (569 cm)
Reach from center of rear axle	263 in. (668 cm)
Loading height (truckloading position)	141 in. (358 cm)
Transport height	139 in. (353 cm)
Bucket rotation	Adjustable for 123° (2.15 rad), 126° (2.19 rad) or 154° (2.69 rad)
Bucket position	
Rollback	Adjustable for 22° (0.384 rad) or 13° (0.227 rad)
Forward	2° (0.035 rad)

EQUIPMENT DATA – CONTINUED

STABILIZER WIDTH	
Transport position	87 in. (221 cm)
Operating position	122 in. (310 cm)
EQUIPMENT CAPACITIES	
Engine crankcase (including filter)	9 qt (8.5 liters)
Fuel tank	19.5 gal (73.8 liters)
Cooling system	13 qt (12.3 liter)
Transmission only (including filters)	8.5 gal (32.2 liters)
Transmission and hydraulic system (including filters)	20.5 gal (77.6 liters)
PERFORMANCE AND ADJUSTMENT DATA	
Engine compression (minimum)	350 psi (2,413 kPa) (difference cannot exceed 50 psi (345 kPa))
Engine valve clearance	
Exhaust valve	0.018 in. (0.4572 mm)
Intake valve	0.014 in. (0.3556 mm)
Engine valve lift (clearance adjusted)	
Exhaust valve	
Wear tolerance	0.426 in. (10.82 mm)
New part	0.456 to 0.482 in (11.58 to 12.24 mm)
Intake valve	
Wear tolerance	0.430 in. (10.92 mm)
New part	0.460 in. to 0.490 in. (11.68 to 12.44 mm)
Engine oil pressure (2,500 rpm)	50 ± 15 psi (345 ± 103 kPa) at 180° to 220°F (82° to 104°C)
Fuel injector pump advance movement	
Total	8° + 1° – 0° (0.136 rad + 0.0174 rad and 0 rad)
Low idle (no load)	0° (0 rad)
1,100 rpm (no load)	4° (0.0698 rad)
2,400 rpm (no load)	8° (0.1396 rad)
V-belt tension under 25 lb (11.34 kg), load at midway between pulleys	0.75 to 1.00 in (19.1 to 25.4 mm)
HYDRAULIC IMPACTOR	
Weight	245 lb (110 kg)
Pressure	124 ft-lb (168 N•m) per blow
Rate	1000 blows per minute at 1800 psi (12411 kPa) hyd. sys.
HYDRAULIC EARTH DRILL	
Weight	210 lb (97 kg)
Spindle speed	90-120 rpm
Maximum pressure	2500 psi (17237 kPa)
Maximum torque at spindle (at maximum pressure)	1100 ft-lb (1491 N•m)

CHAPTER 2

OPERATING INSTRUCTIONS

OVERVIEW

This chapter gives information on maintaining loader backhoe for different operations and conditions. It explains how to use loader backhoe under usual and unusual conditions. It also tells how to operate and maintain equipment special to loader backhoe.

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Section I.	Description and Use of Operator's Controls and Indicators	2-1
Section II.	Preventive Maintenance Checks and Services (PMCS)	2-10
Section III.	Operation Under Usual Conditions	2-59
Section IV.	Operation Under Unusual Conditions	2-135

Section I. DESCRIPTION AND USE OF OPERATOR'S CONTROLS AND INDICATORS

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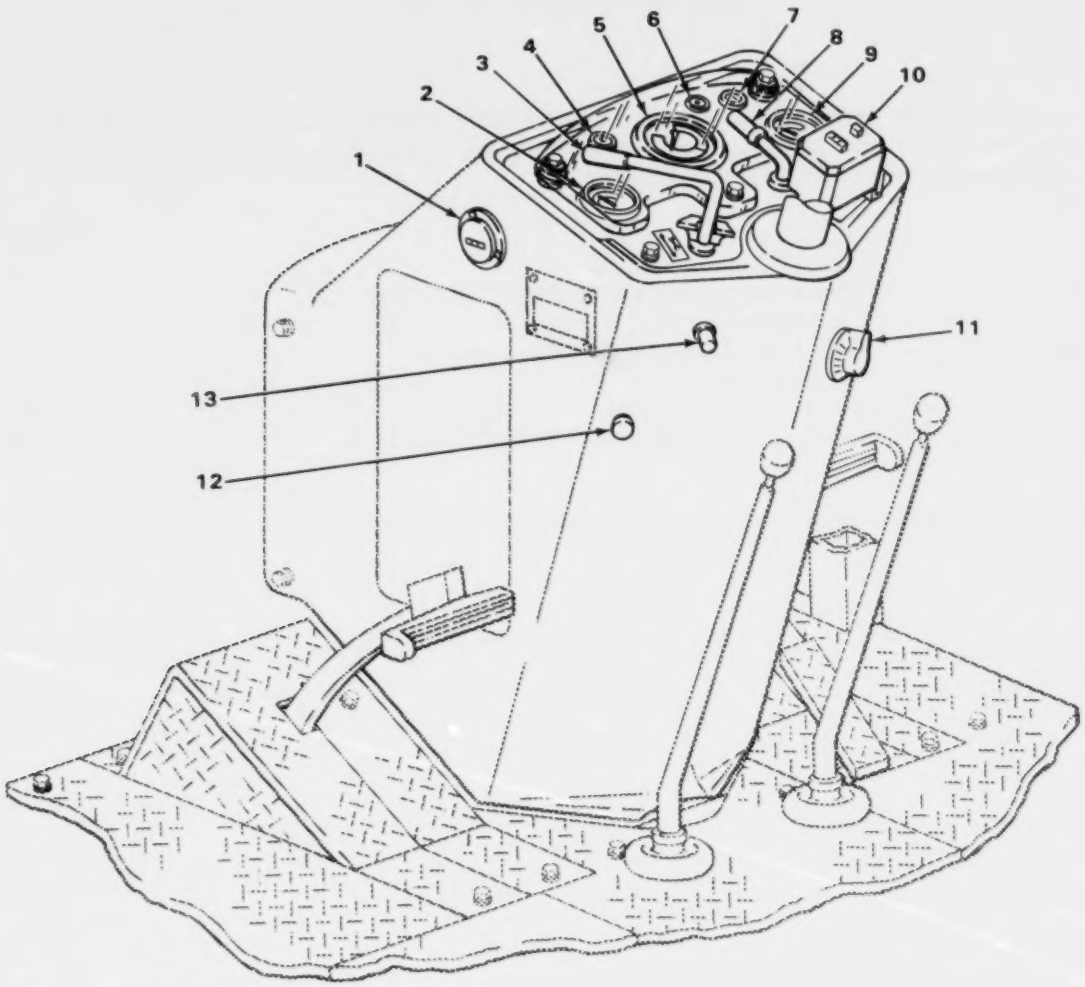
Cab	2-2	External	2-10
Engine	2-9		

CAB



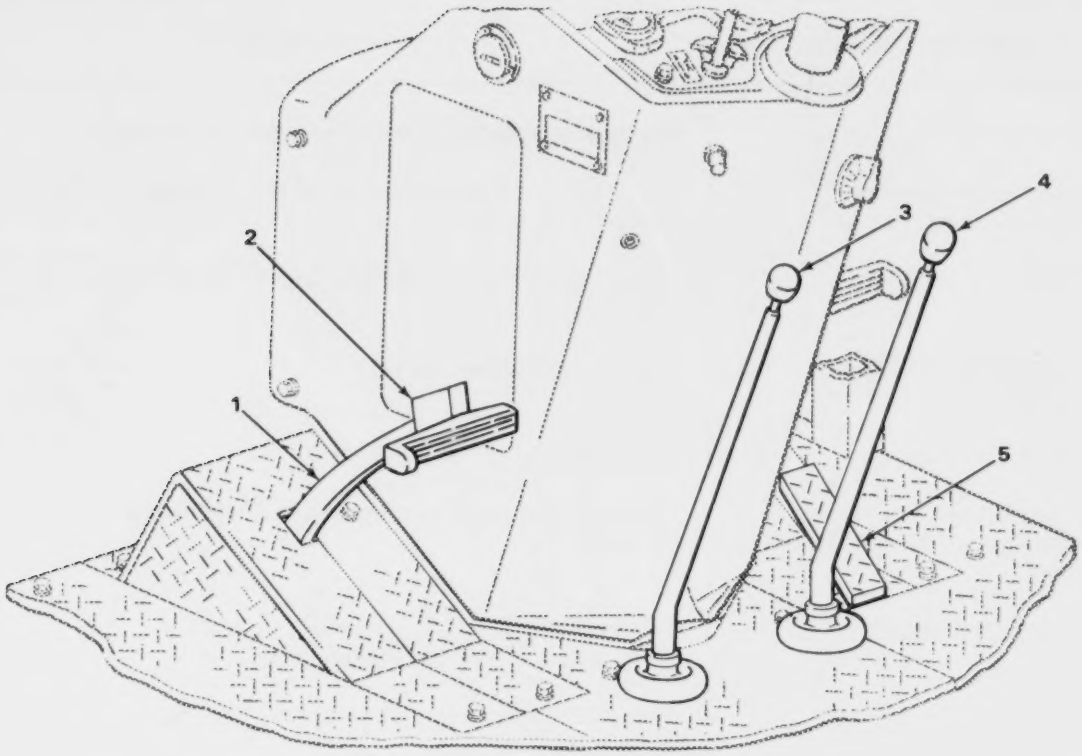
KEY	CONTROL OR INDICATOR	FUNCTION OR USE
1	Time Total Meter	Shows number of hours engine has run. Check to determine when periodic service is needed.
2	ENGINE WATER TEMP. Gage	Shows engine coolant temperature.
3	Speed Gear Assembly (Reverser) Control Lever	Changes loader backhoe direction of travel while vehicle is moving without using clutch or shifting gears. Also shifts and locks reverser into neutral.
4	Alternator Indicator Light	Lights when alternator is not charging.

TA234813

CAB – CONTINUED

KEY	CONTROL OR INDICATOR	FUNCTION OR USE
5	Tachometer	Shows engine speed in revolutions per minute (rpm).
6	Engine Oil Pressure Indicator Light	Lights when engine oil pressure or when engine oil level is too low.
7	Parking Brake Light	Lights when parking brake is engaged and key switch is in ON position.
8	Instrument Panel Dash Lamp	Lights up instrument panel.
9	FUEL Level Gage	Registers level of fuel in fuel tank.
10	Turn Signal Control and Emergency Flasher Control Unit	Turns on right or left turn signal and flasher warning lights.
11	Light Control Switch	Turns headlights bright, dim, rear combination lights, and warning lights on and off.
12	Cigar Lighter	Becomes red hot, when pushed in, to light cigars or cigarettes.
13	Horn Button	Sounds loader backhoe horn.

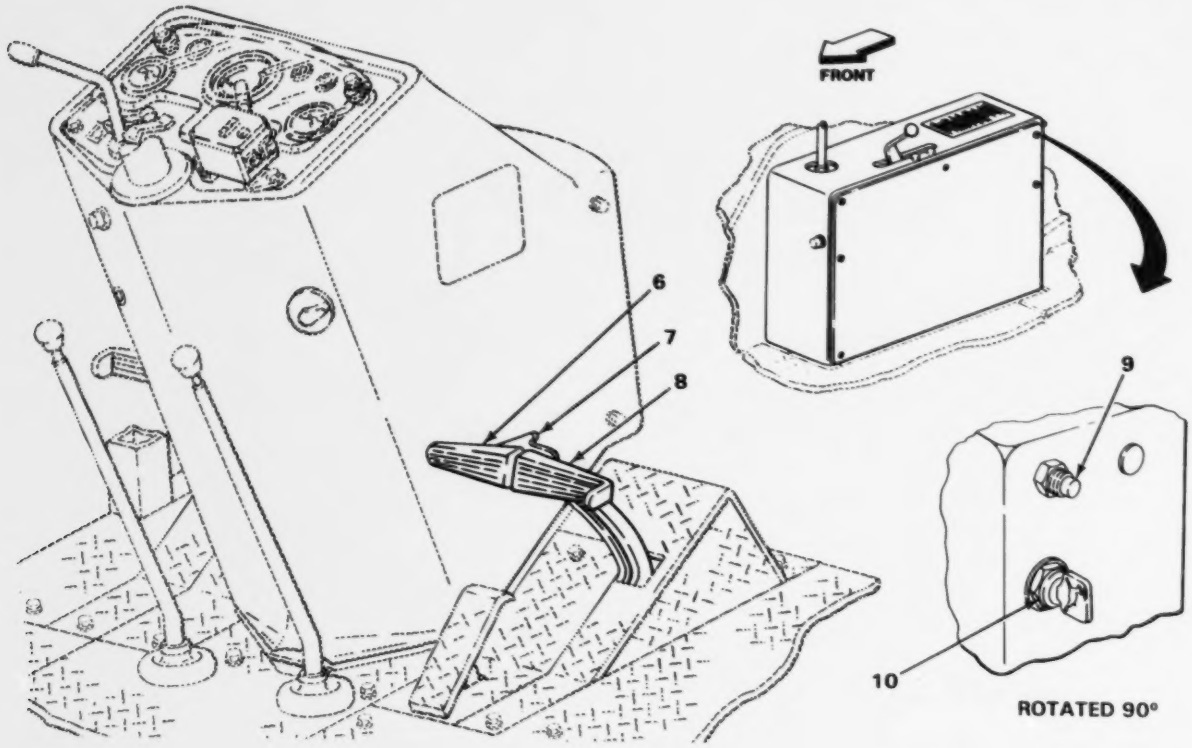
CAB – CONTINUED



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
1	Clutch Pedal	Disengages engine rotation to reverser transmission when depressed.
2	Clutch Pedal Stop	When in up position, allows complete disengagement of engine rotation to reverser transmission for faster engine cranking during cold weather startup. Down position for normal operation.
3	Range Shift Lever	Shifts main transmission from neutral to low or high speed ranges.
4	Gear Shift Lever	Shifts main transmission in first thru fourth gears or fifth thru eighth gears, depending on transmission being in low or high range.
5	Throttle Foot Control	Controls engine speed by foot.

TA234814

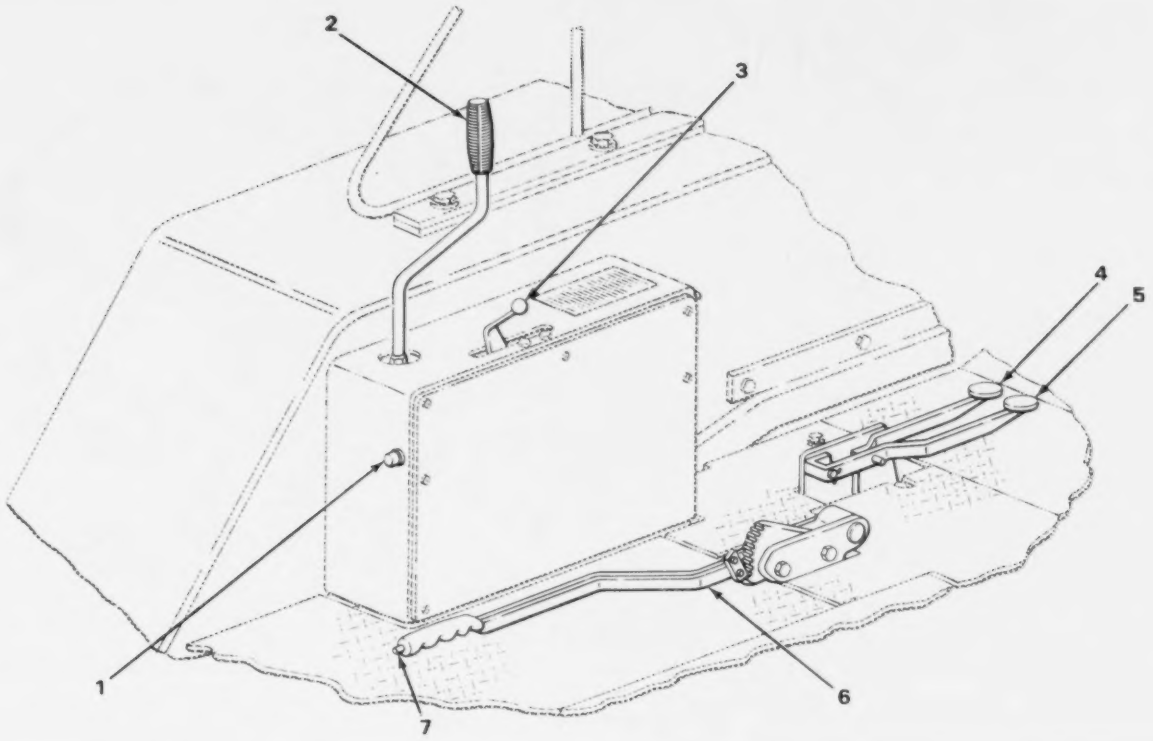
CAB – CONTINUED



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
6	Left Brake Pedal	If brake pedal lock is not engaged, activates only left side brake. Advantageous when making tight left turns.
7	Brake Pedal Lock	Locks both brake pedals so brakes are applied simultaneously. Keep in locked position for normal operation.
8	Right Brake Pedal	If brake pedal lock is not engaged, activates only right side brake. Advantageous when making tight right turns.
9	Starter Button	When depressed and key switch is in ON position, starter cranks engine.
10	Key Switch	Turns on power to starter button when rotated right. Turns power OFF and shuts engine off when rotated left.

TA234815

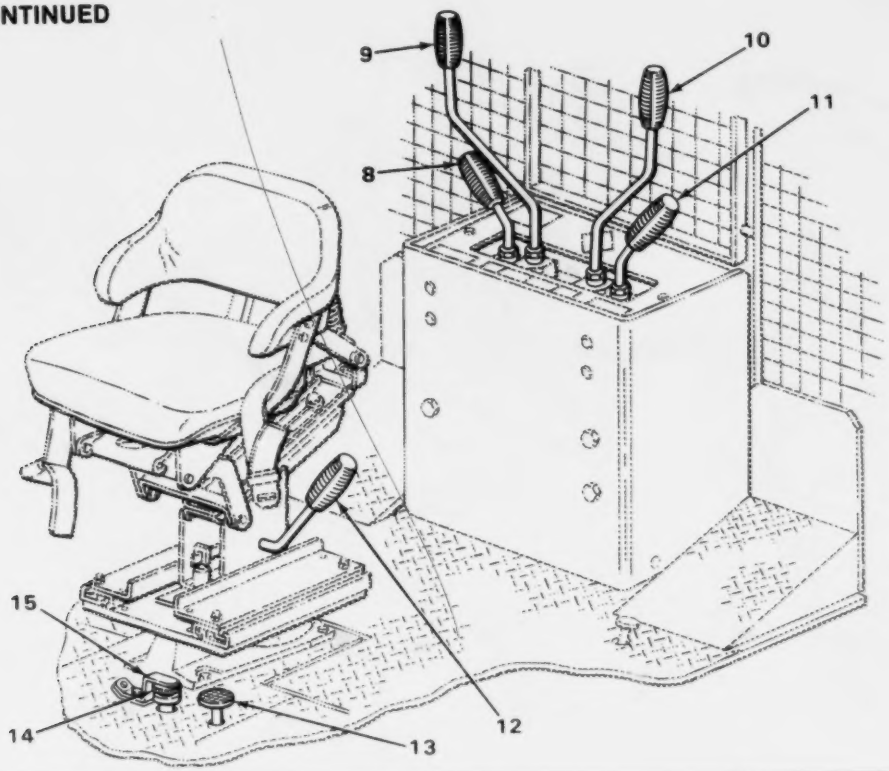
CAB – CONTINUED



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
1	Starting Aid Button	When activated, releases measured shots of starting fluid for cold weather starts.
2	Loader Control Lever	Raises, lowers, retracts and dumps loader bucket.
3	Hand Throttle	Controls engine speed by hand.
4	Jaw Bucket Pedal, Short	Opens Wain-Roy jaw bucket.
5	Jaw Bucket Pedal, Long	Closes Wain-Roy jaw bucket.
6	Parking Brake Lever	Applies parking brake to differential so final drive axles will not turn.
7	Parking Brake Lever Release Button	Releases parking brake lever.

TA234816

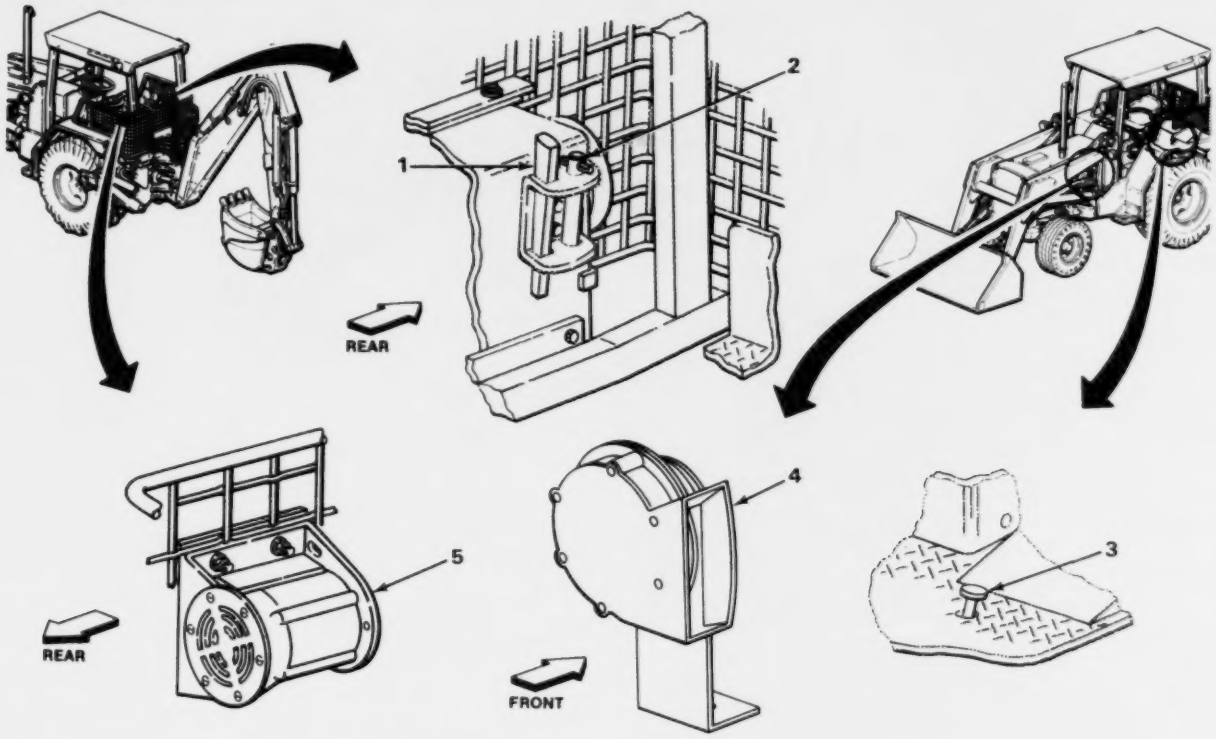
CAB – CONTINUED



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
8	Right Stabilizer Control Lever	Moves right stabilizer up and down.
9	Backhoe Boom Control Lever	Moves backhoe boom up, down, left, and right.
10	Backhoe Bucket Control Lever	Moves dipperstick up and down, also retracts and dumps backhoe bucket.
11	Left Stabilizer Control Lever	Moves left stabilizer up and down.
12	Seat Pivot Release Lever	Releases seat to move forward and backward, also allows seat to pivot from front to back.
13	Differential Lock Pedal	Locks differential so both rear wheels drive equally for added traction.
14	Transmission Dipstick and Filler Cap	Dipstick gage under filler cap shows transmission fluid level.
15	Transmission Filler Lock	Allows transmission dipstick and filler cap to be locked in place.

TA234763

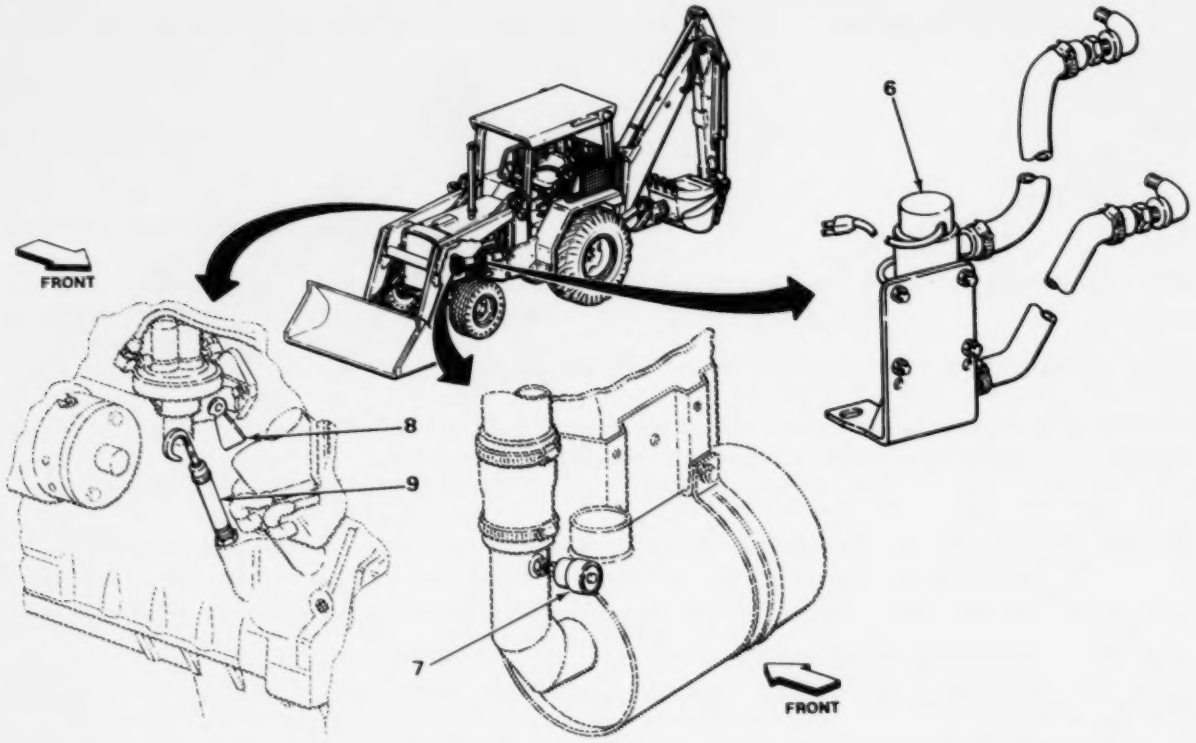
CAB – CONTINUED



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
1	Boom Lockpin	Keeps backhoe boom from moving up and down, and reduces strain on backhoe boom cylinder during driving and transporting.
2	Swing Lockpin	Prevents backhoe boom from swinging right or left during driving and transporting.
3	Hydraulic Impactor Actuating Pedal	Activates Hughes Hydraulic Impactor.
4	Electric Horn	Sounds when horn button is depressed and when loader backhoe is put in gear with parking brake on.
5	Reverse Warning Alarm	Sounds when loader backhoe travels in reverse.

TA234764

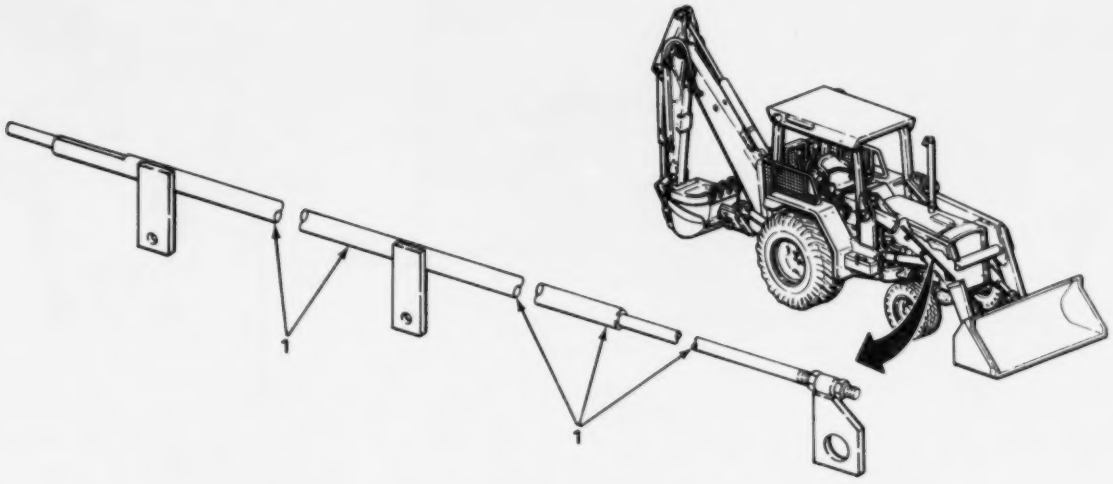
ENGINE



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
6	Engine Coolant Heater (optional)	Heats engine coolant when plugged into 115-volt electrical outlet ten hours before starting. Not all loader backhoes are equipped with this option.
7	Air Restriction Indicator	Shows red in sight window when air cleaner is dirty.
8	Fuel Transfer Pump Primer Lever	Used as an aid in bleeding the fuel system. Should be in closed position (toward engine) during engine operation.
9	Engine Oil Level Gage	Oil level gage shows engine oil level.

TA234765

EXTERNAL



KEY	CONTROL OR INDICATOR	FUNCTION OR USE
1	Loader Bucket Level Indicator	Shows when loader bucket is level. Indicator will work with loader bucket lift arms in any position.

Section II. PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

	Page		Page
Explanation of Columns	2-12	PMCS Procedures	2-11
General	2-10	Special Instructions	2-12
Operator/Crew Preventive Maintenance Checks and Services (PMCS)	2-13		

GENERAL

This section contains checks and services that must be done to make sure loader backhoe is kept in operational condition. Do checks and services at interval shown in Preventive Maintenance Checks and Services (PMCS) chart using the following as a guide:

Do (B)PMCS before operating loader backhoe. Pay attention to WARNINGs and CAUTIONs.

Do (D)PMCS during operation of loader backhoe. Be sure to watch equipment and gages while loader backhoe is operational. Pay attention to WARNINGs and CAUTIONs.

TA234766

GENERAL – CONTINUED

Do (A) PMCS after operating loader backhoe. Pay attention to WARNINGs and CAUTIONs.

Do (W) PMCS once a week.

Do (M) PMCS once a month.

PMCS PROCEDURES

Always do checks and services in the same order. The pattern will become a habit and, with practice,anything wrong will be spotted at once.

If something does not work, use troubleshooting instructions in this manual and notify your supervisor.

If anything looks wrong and you cannot fix it, write it up on DA Form 2404. If something is seriously wrong, notify your supervisor. Don't accept or operate loader backhoe if there is a nonoperational condition described in the "Equipment Is Not Ready/Available If:" column.

Take along tools and cleaning rags needed to make required checks and services. Use the following information to help identify potential problems before and during the checks and services.

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

Dirt, grease, and oil get in the way and may cover up a serious problem. Use drycleaning solvent P-D-680 to clean metal surfaces. Use soap and water when you clean rubber parts and material.

Check screws and nuts to make sure they're not loose, missing, bent, or broken. Don't try to check them with a tool, instead, look for chipped paint, bare metal, or rust around screwheads. If you find one loose, tighten it. If you think it has to be torqued, notify Organizational Maintenance.

Look for loose or chipped paint, rust, or gaps where parts are welded together. If a bad weld is found, notify your supervisor.

Look for cracked or broken electrical insulation, bare electrical wires, and loose or broken connectors. Tighten loose connectors, and replace bad wiring.

Look for splits or cracks in hoses and hard lines. Check for leaks. Make sure all clamps and fittings are tight. Stains around a fitting or connection can mean a leak. If leaks are found, tighten fitting or connection and watch it during loader backhoe operation. If something is broken or worn out, notify Organization Maintenance to replace it.

SPECIAL INSTRUCTIONS

LEAKAGE DEFINITIONS

You need to know how fluid leaks affect operation of loader backhoe and its equipment. The following definitions give types and classes of leaks. They will help you determine status of your loader backhoe. Learn what to look for when checking leaks. When in doubt, notify your supervisor. Leakage definitions for Operator/Crew PMCS shall be classified as follows:

Class I	Seepage of fluid (indicated by wetness or discoloration) not great enough to form drops.
Class II	Leakage of fluid great enough to form drops, but not enough to cause drops to drip from the item being checked/inspected.
Class III	Leakage of fluid great enough to form drops that fall from the item being checked/inspected.

CAUTION

Loader backhoe operation is allowable with minor leakage (Class I or II), but you must consider the fluid level in the part/system being checked/inspected. Parts or systems that are operated without fluid will stop working and cause damage to loader backhoe. When in doubt, notify your supervisor.

When operating with Class I or Class II leaks, continue to check fluid levels as required in your PMCS.

Class III leaks should be reported to your supervisor or Organizational Maintenance.

EXPLANATION OF COLUMNS

There are several columns in the PMCS. The following information tells you what is in each column:

Item No. – this column identifies the item number you will enter on DA form 2404 in the "TM Number" column when recording the results of your PMCS.

Interval – columns (B), (D), (A), (W), and (M) contain a dot (•) opposite each check to be performed. If dot is placed in (B) column opposite a check, perform this check before operation of loader backhoe. If dot is placed in (D) column opposite a check, perform this check while loader backhoe is in operation. If dot is placed in (A) column opposite a check, perform this check after operation. If dot is placed in (W) column opposite a check, perform this check weekly. If dot is placed in (M) column opposite a check, perform this check monthly. If dot is placed opposite same check in two or more columns, perform this check during each interval.

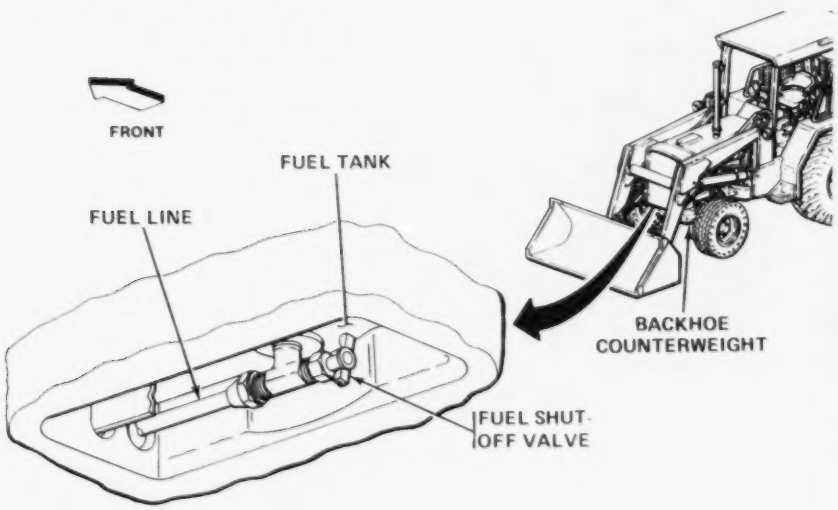
Item To Be Inspected – this column is divided into groups and lists each item to be inspected within that group. It also explains how to perform your checks and services.

Equipment Is Not Ready/Available If: – this column lists those items which will cause the loader backhoe to be reported "not ready" because it will not be able to perform its primary mission.

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS)

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
						NOTE Perform (W) as well as (B) before PMCS if: You are assigned operator but have not operated loader backhoe since last weekly inspection. You are operating loader backhoe for the first time.	
1						MAKE THE FOLLOWING WALK AROUND CHECKS	
	•					a. Look below fuel tank and above and below loader backhoe counterweight for any signs of diesel fuel leaks. Check lower front of fuel tank behind loader backhoe counterweight for fuel leaks at fuel shut off valve and fuel line.	Any diesel fuel leaks are found.

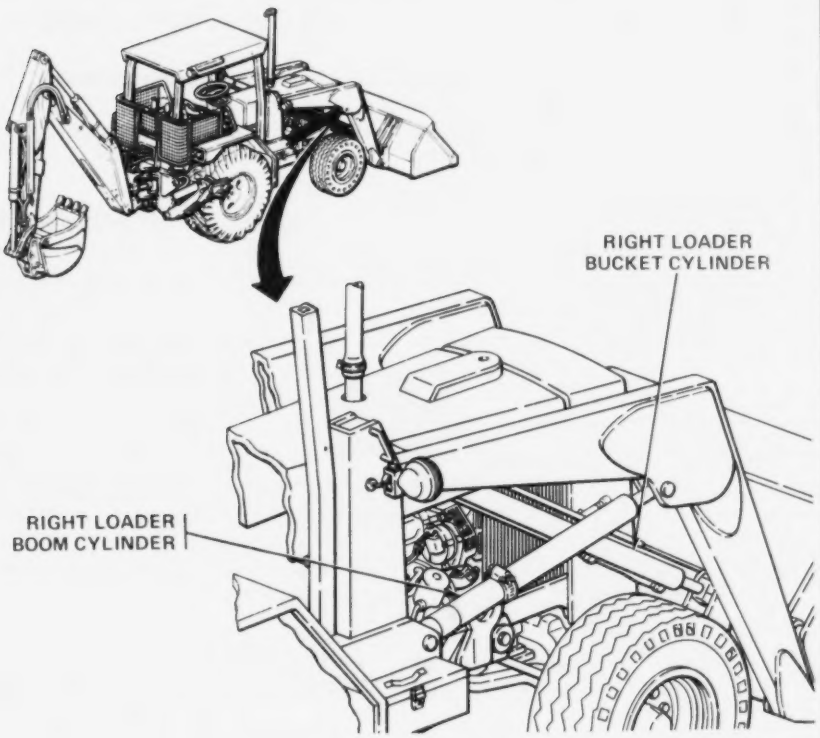


TA234767

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					b. Look at right loader bucket cylinder, lines, and connections and right loader boom cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).

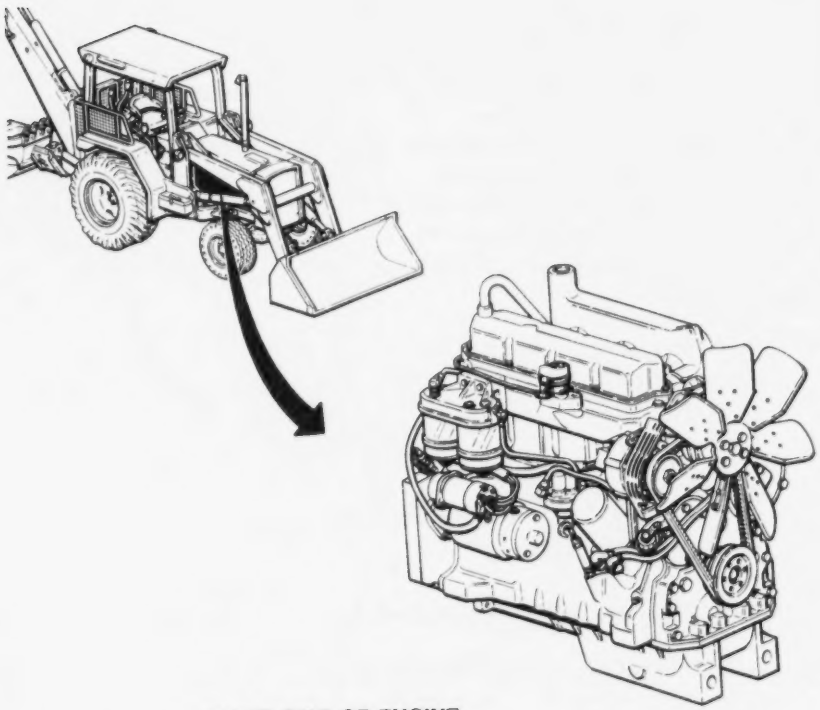


TA234768

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					c. Look at right side of engine for engine oil and coolant leaks. Check all lines, hoses, filters, and connections for leaks.	You have Class III leaks (page 2-12).



RIGHT SIDE OF ENGINE

TA234769

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

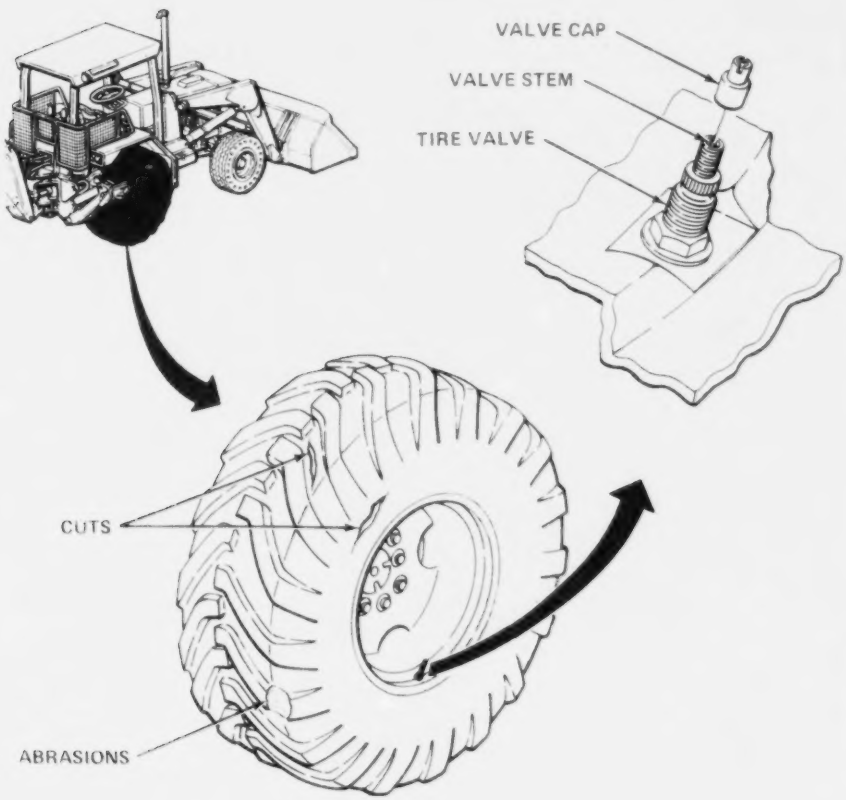
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
				•		d. Check tires for correct pressure as follows:	
						NOTE There are four tires on loader backhoe. Tire pressure check is done the same way for each tire, although tire pressure rating is different for front and rear tires. The right rear tire is shown.	
						1. Unscrew tire valve cap from tire valve. Check tire pressure using 10 to 160 psi tire pressure gage. Tire pressure for front wheels should be 48 psi (331 kPa) and tire pressure for rear wheels should be 22 psi (152 kPa).	Tire will not hold air pressure and cannot be repaired.
						2. If tire pressure is correct, screw tire valve cap onto tire valve and tighten.	
						3. If tire pressure is too low, service tire (page 3-58).	
						4. If tire is flat and will not maintain proper pressure, notify Organizational Maintenance.	
						5. If tire has too much air pressure, press in on valve stem with pointed end of tire valve cap until pressure is reduced to correct level. Check tire pressure again with 10 to 160 psi tire pressure gage.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED 6. Repeat step (5) for reducing air pressure if necessary. Screw tire valve cap onto tire valve, and tighten.	
	•					e. Look at tires for cuts and abrasions.	You have tires that have cuts or abrasions which could result in tire failure during operation. One or more tires missing or unserviceable.

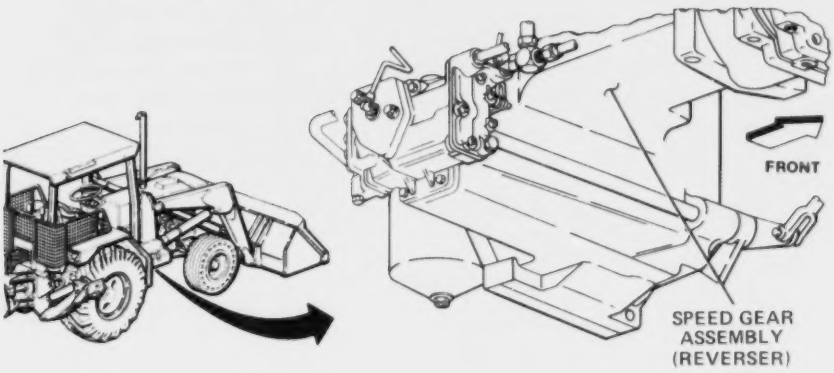


TA234770

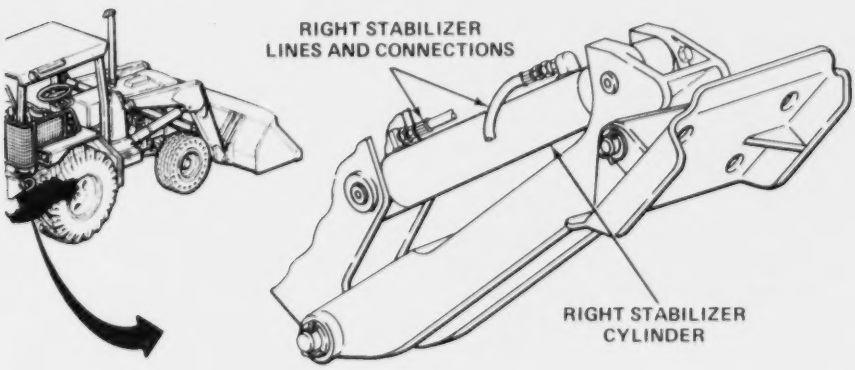
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					f. Look for fluid leaks under cab, near speed gear assembly (reverser).	You have Class III leaks (page 2-12).



	•					g. Look at right stabilizer cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).

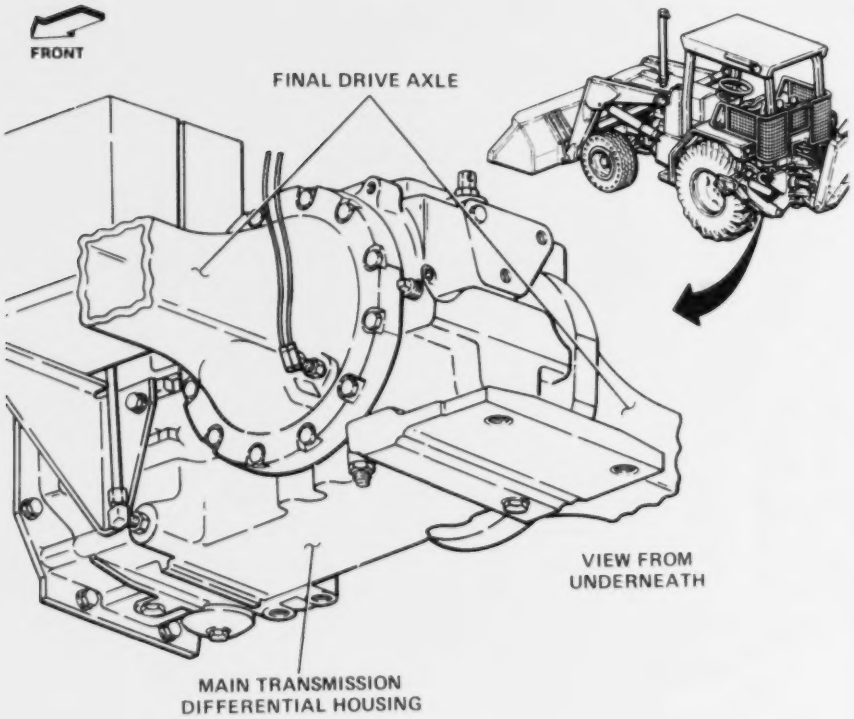


TA234771

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					h. Look under main transmission and differential housing for fluid leaks.	You have Class III leaks (page 2-12).
	•					i. Look under final drive axles for fluid leaks.	You have Class III leaks (page 2-12).

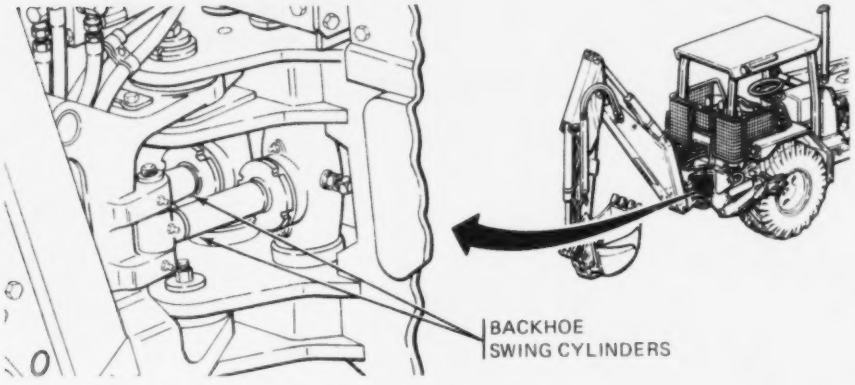


TA234772

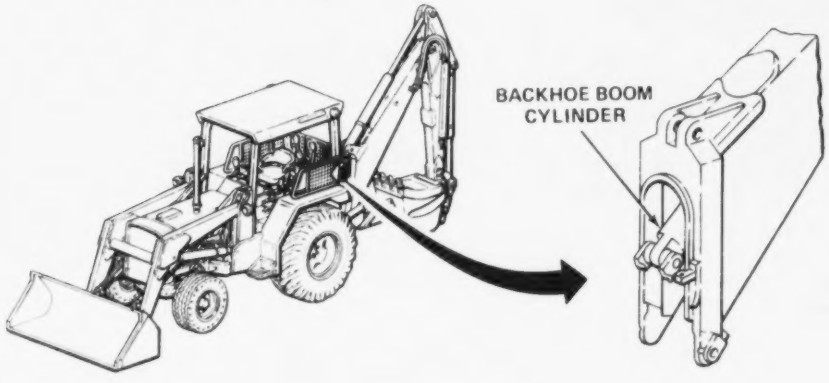
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					j. Look at both backhoe swing cylinders, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).



	•					k. Look at backhoe boom cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).



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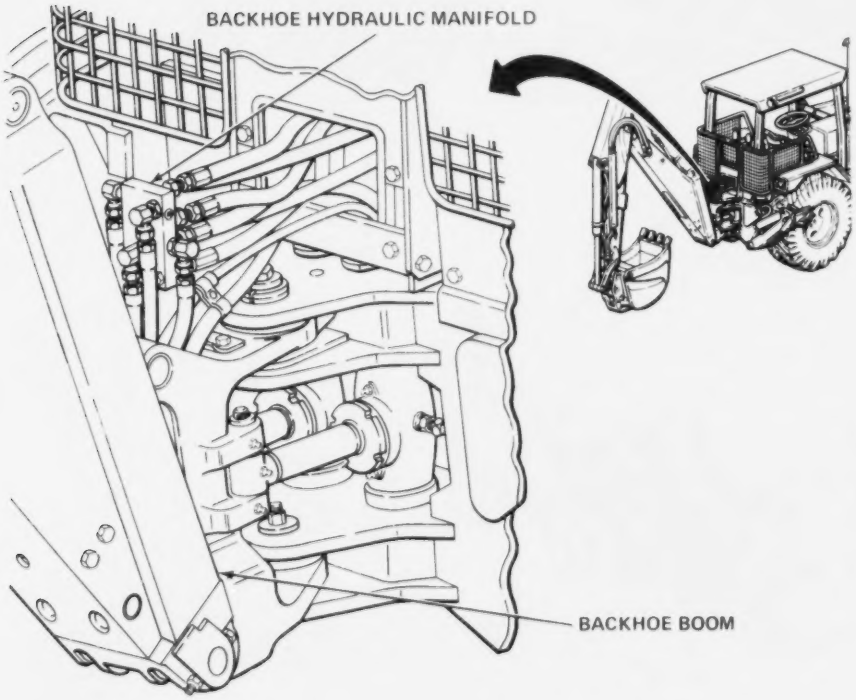
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					I. Look under backhoe boom and backhoe hydraulic manifold, at lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).

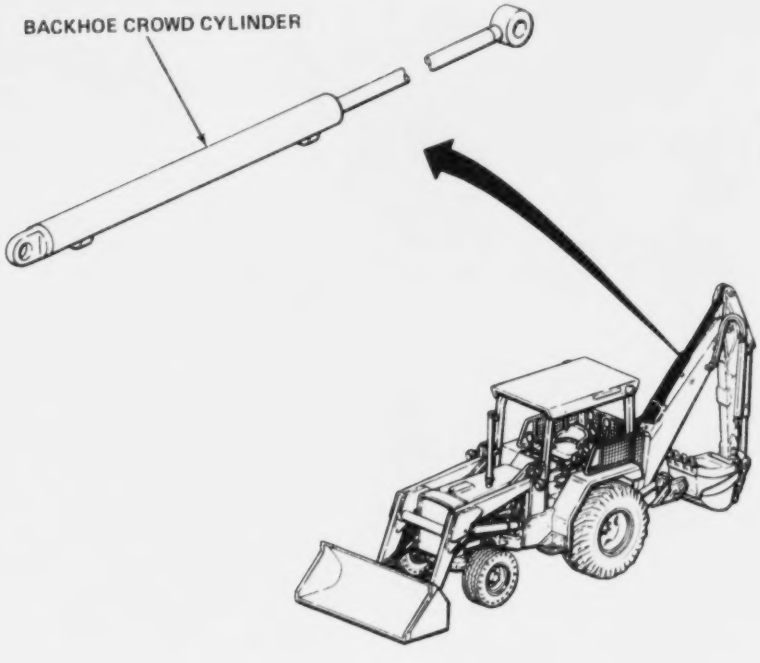


TA234774

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					m. Look at backhoe crowd cylinder, lines, and connections for fluid leaks	You have Class III leaks (page 2-12).

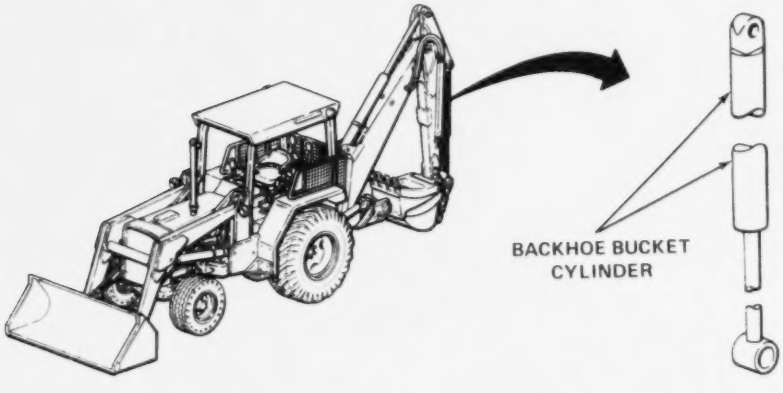


TA234775

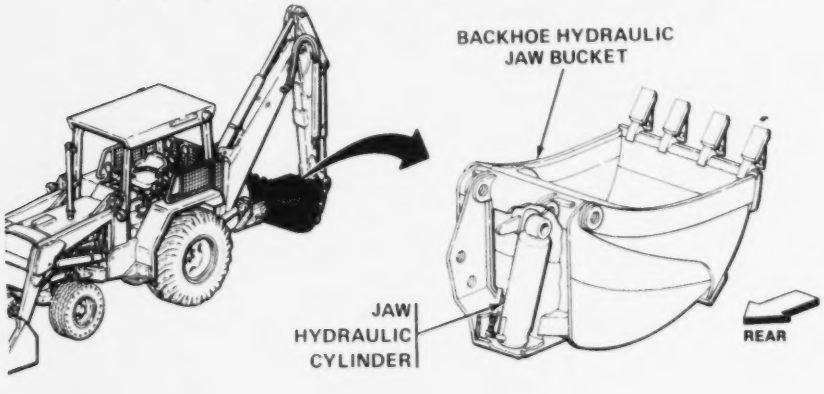
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					n. Look under backhoe bucket cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).



	•					o. Look inside backhoe hydraulic jaw bucket, under jaw hydraulic cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12).

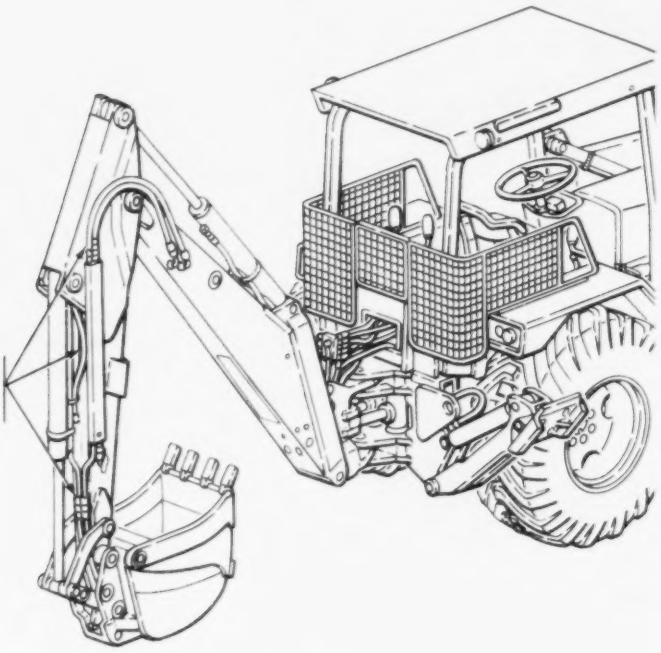


TA234776

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					p. Look at lines and connections on backhoe boom and dipperstick for fluid leaks.	You have Class III leaks (page 2-12).

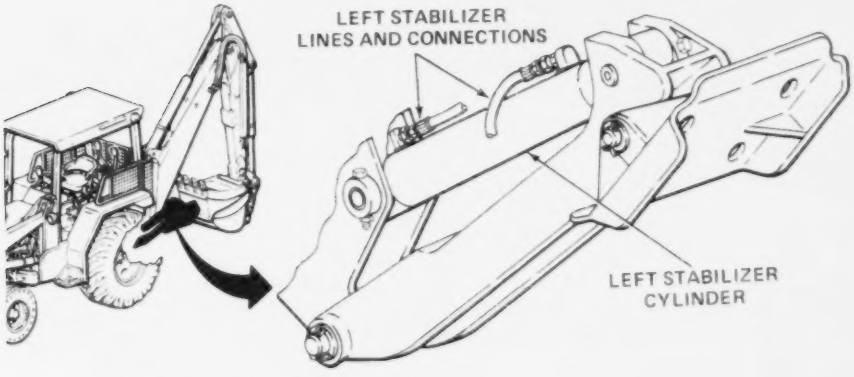


TA234777

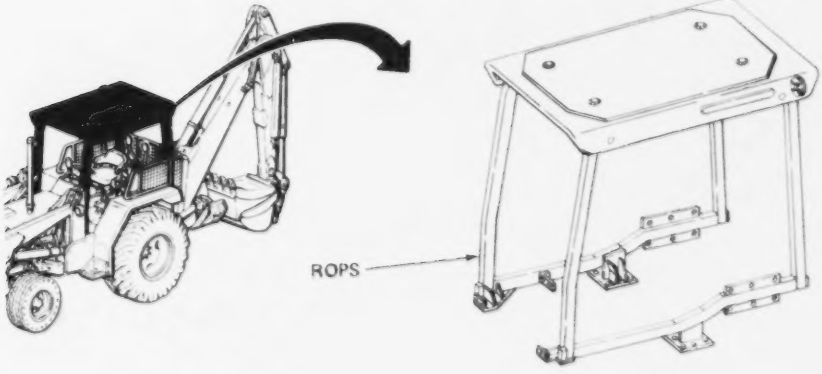
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					q. Look at left stabilizer cylinder, lines, and connections for fluid leaks.	You have Class III leaks (page 2-12)



	•					r. Look at ROPS for cracked welds, buckled, or split seams. Look for broken, missing, or loose mounting hardware.	You have cracked welds, buckled, or split seams. You have broken, missing or loose mounting hardware.

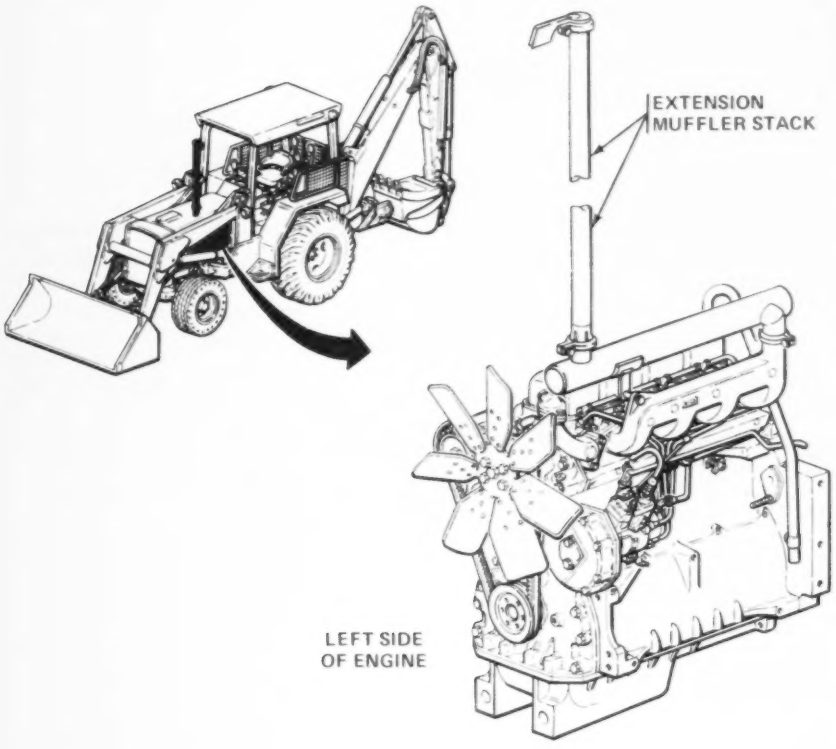


TA234778

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					s. Check left side of engine for engine oil and coolant leaks. Check all lines, hoses and connections for leaks.	You have Class III leaks (page 2-12)
						t. Look at extension muffler stack for cracks, rust holes and missing hardware.	Extension muffler stack has cracks, rust holes or missing hardware.

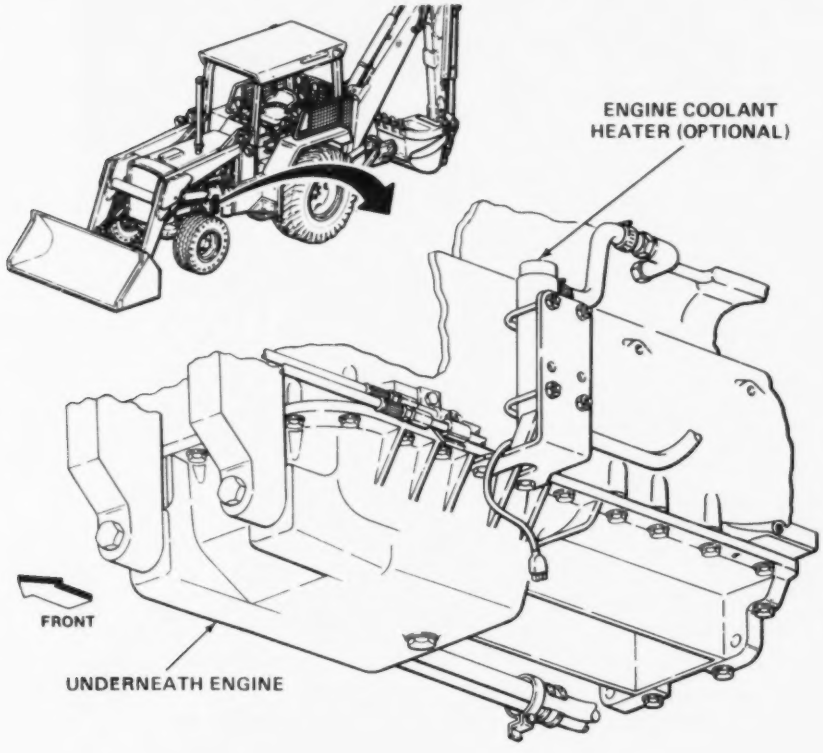


TA234779

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					u. Look under engine for engine oil, coolant and hydraulic fluid leaks.	You have Class III leaks (page 2-12).
						v. If your vehicle is equipped with an engine coolant heater, look for coolant leaks, frayed electrical cord and missing hardware.	Engine coolant heater or hoses leak, frayed electrical cord or missing hardware.

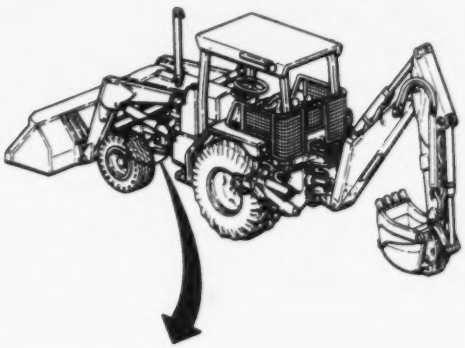


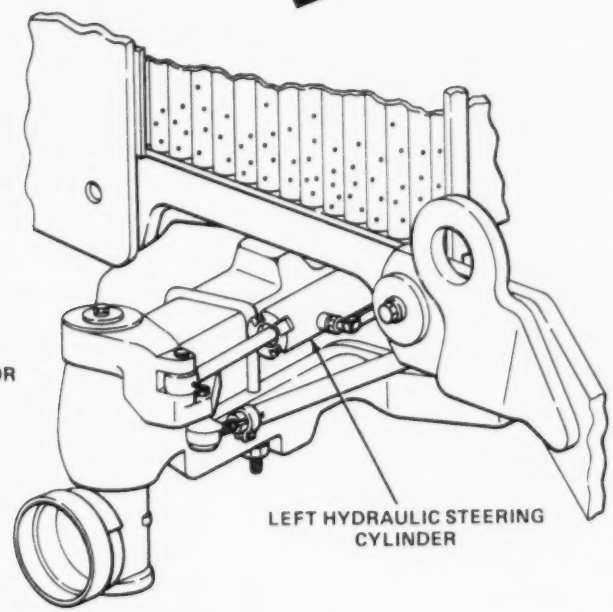
TA234780

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					w. Look at hydraulic steering cylinder, lines, and connections, on left side of vehicle, for fluid leaks.	You have Class III leaks (page 2-12).



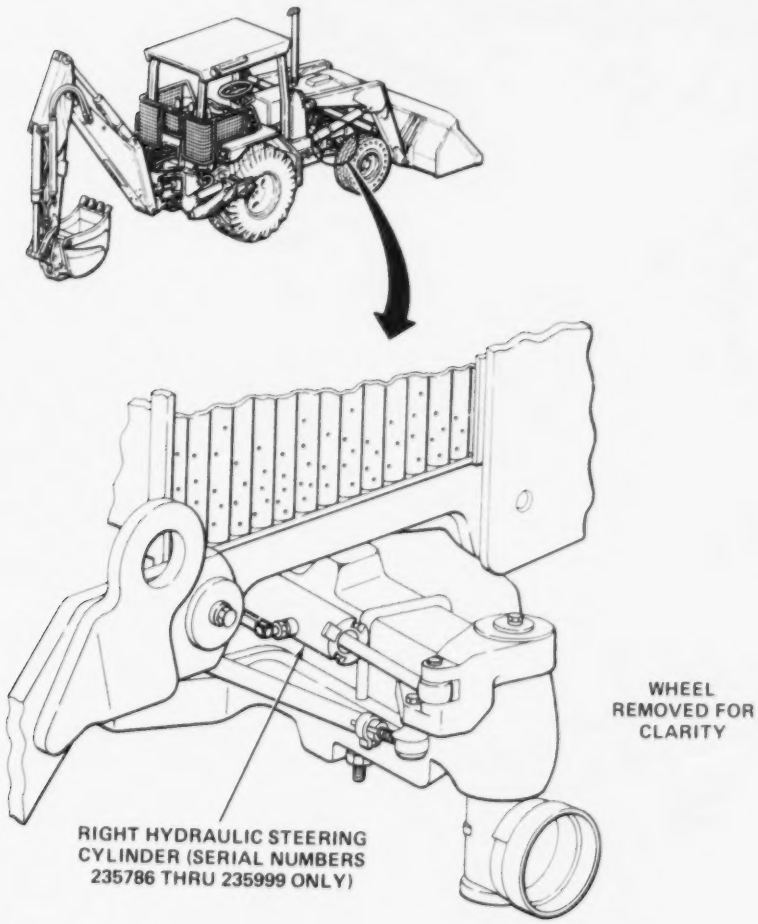


TA234781

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					x. Look at hydraulic steering cylinder, lines, and connections, on right side of vehicle (Serial Numbers 235786 thru 235999 only), for fluid leaks.	You have Class III leaks (page 2-12).

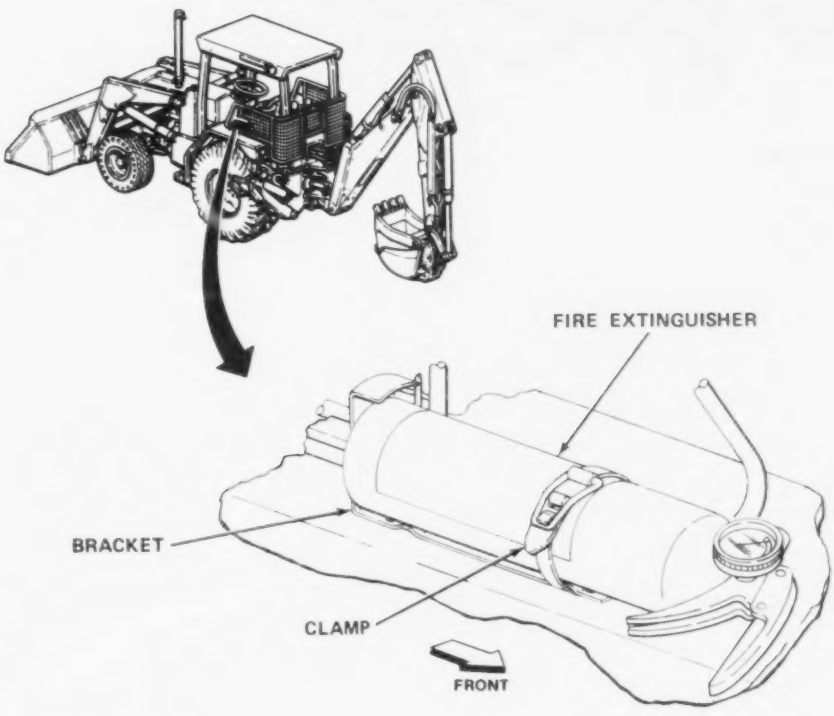


TA234782

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					y. Check that fire extinguisher is secure in bracket on fender to left of operator's seat when facing loader. Visually check that fire extinguisher has proper pressure (TB 5-4200-200-10). If fire extinguisher does not have proper pressure, replace it.	

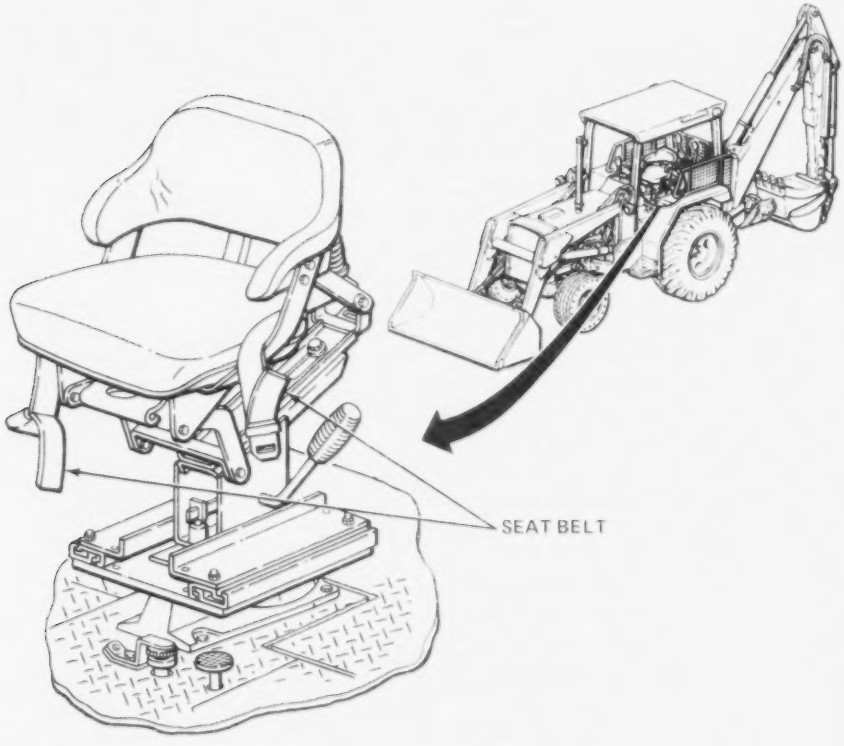


TA234783

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
1						MAKE THE FOLLOWING WALK AROUND CHECKS – CONTINUED	
	•					z. Check if seat belt is frayed, damaged, or is missing hardware.	Seat belt is frayed, damaged, or is missing hardware.
	•					aa. Visually check seat for loose, missing, or damaged parts.	Seat has loose, missing, or damaged parts.



TA234784

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

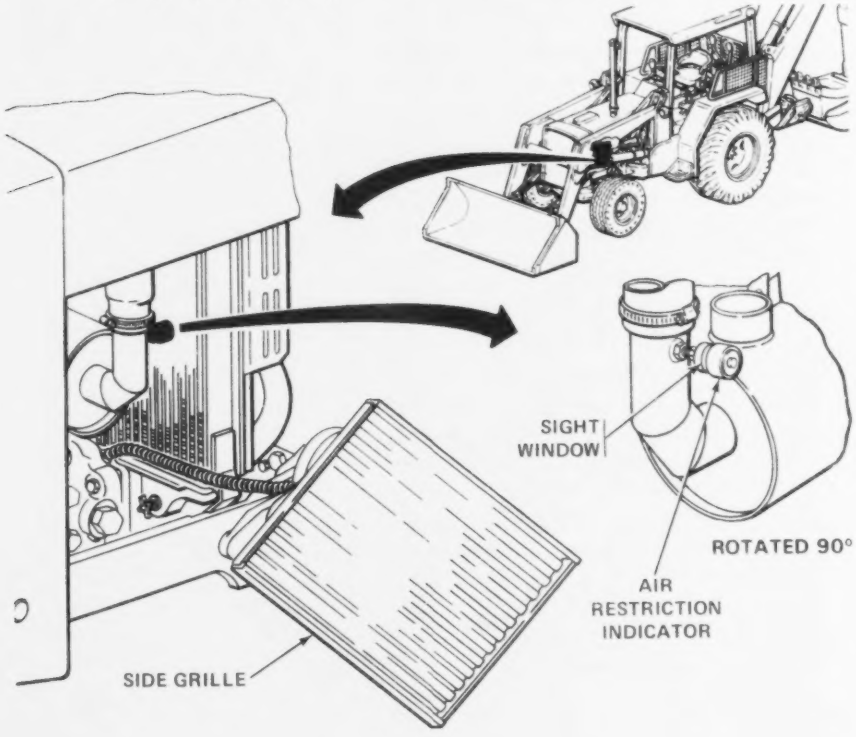
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
2						AIR RESTRICTION INDICATOR **WARNING** After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double-lined plastic bags and swiftly moved to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination, however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
2						AIR RESTRICTION INDICATOR – CONTINUED Check air restriction indicator by doing the following: 1. Remove left side grille by pulling out on top, then up until bottom is released. Move inside and let hang by spring. 2. Indicator will show all red in sight window when service to air cleaner is required (page 3-25).	
	•						Indicator sight window shows all red.



TA234785

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

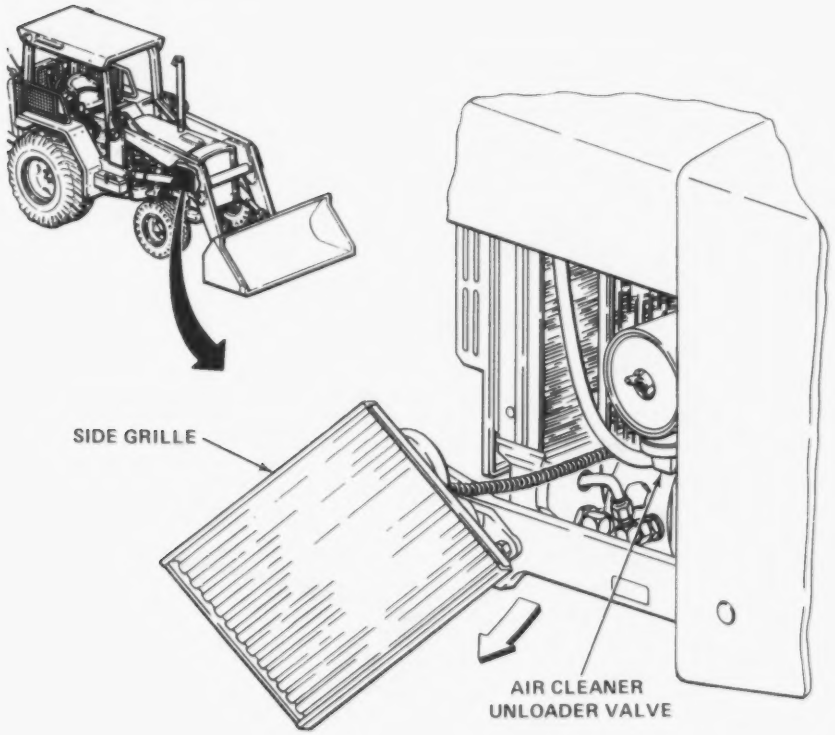
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
3						AIR CLEANER **WARNING** After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double-lined plastic bags and swiftly moved to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination, however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
3						AIR CLEANER – CONTINUED Check air cleaner by doing the following: 1. Remove right side grille by pulling out on top, then up until bottom is released. Move aside and let hang by spring. 2. Check air cleaner unloader valve, under air cleaner for clogging. Dump any accumulation of dirt by squeezing the rubber outlet.	
				•			

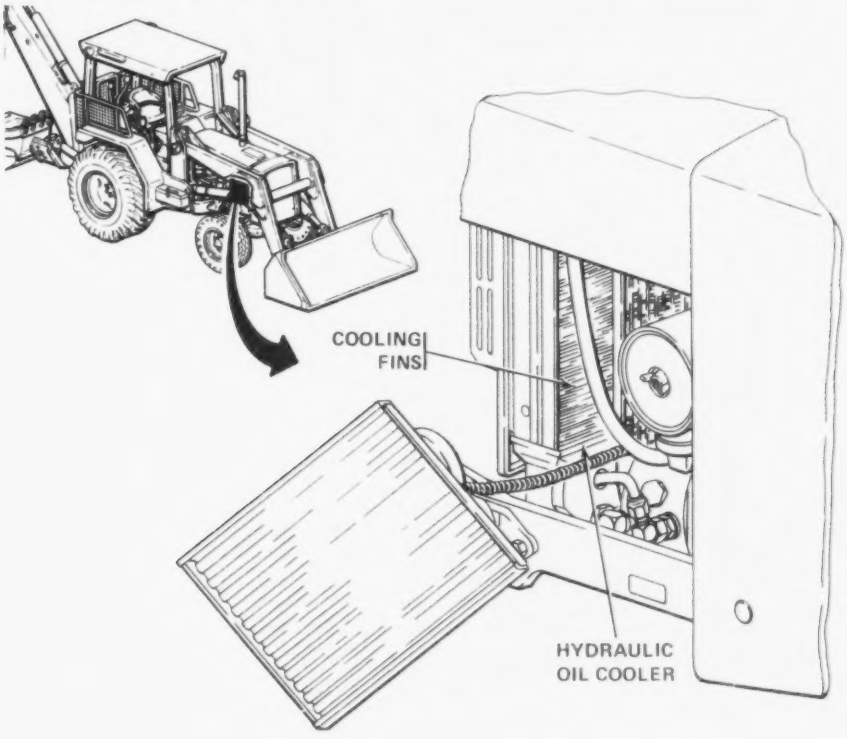


TA234786

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
4						HYDRAULIC OIL COOLER	
	•					a. Check hydraulic oil cooler, lines, hoses and connections for fluid leaks.	You have Class III leaks (page 2-12).
	•					b. Check for bent cooling fins in core of hydraulic oil cooler. Have Organizational Maintenance straighten any bent fins.	

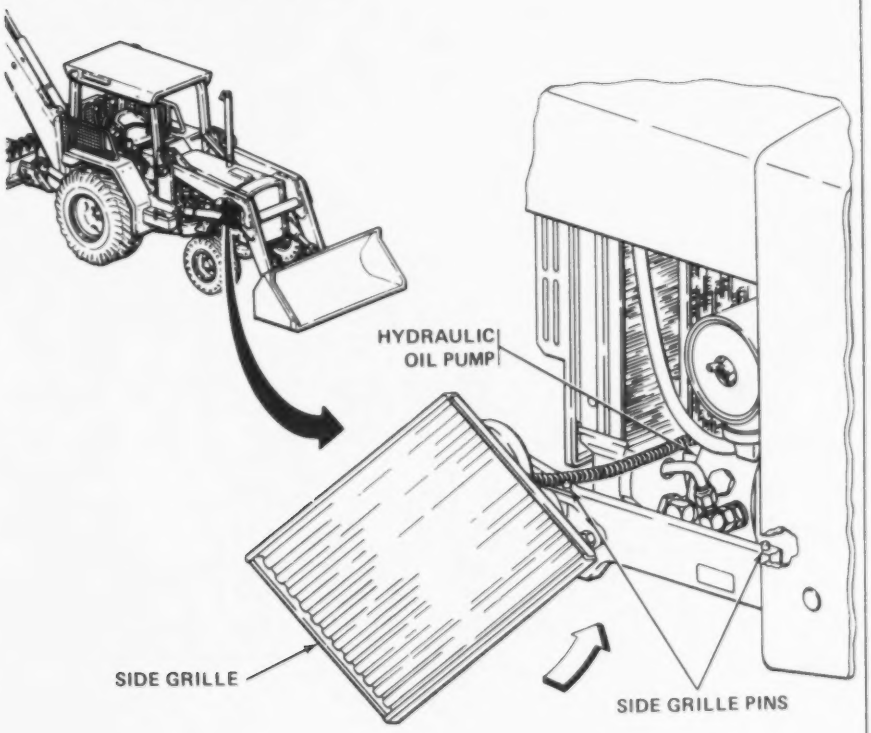


TA234787

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
5						HYDRAULIC OIL PUMP	
	•					a. Check hydraulic oil pump, lines, fittings and connections, on both sides of vehicle, for fluid leaks.	You have Class III leaks (page 2-12).
	•					b. Place holes in bottom of right and left side grilles on pins of front frame and allow springs to pull side grilles back in position.	

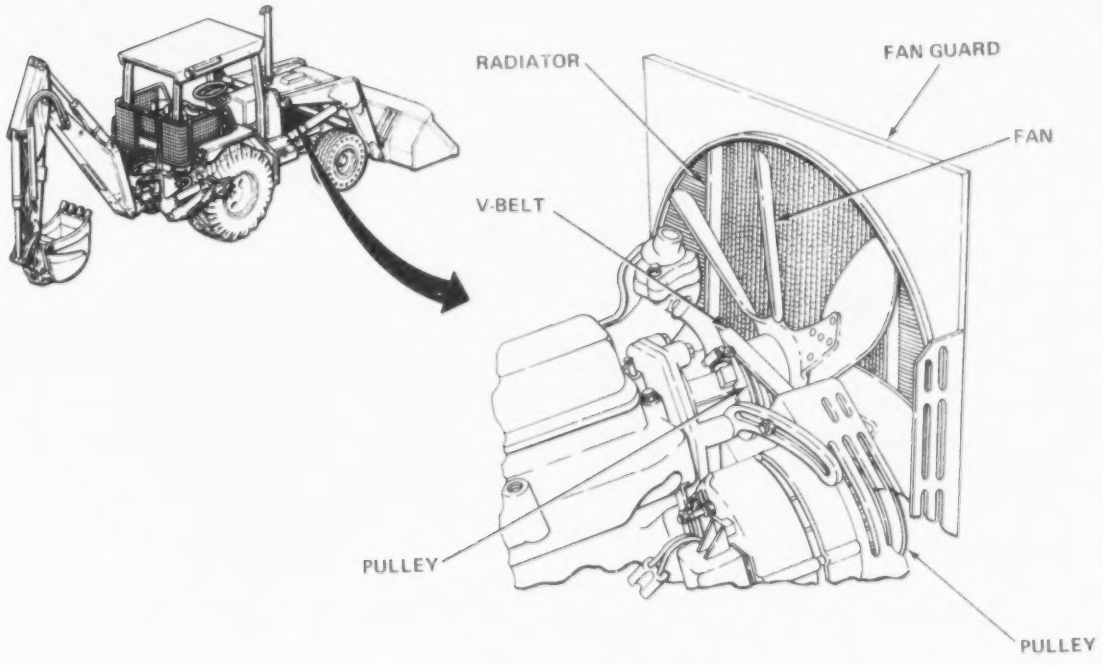


TA234788

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
6						V-BELT	
	•					a. Remove any built up dirt and debris from engine fan guard, V-belts, and pulleys.	
				•		b. Look at alternator/fan belt for signs of fraying, rotting, or looseness. If belt is loose or damaged, notify Organizational Maintenance.	Belt missing, frayed, or broken.
7		•				FAN	
						Check clearance between fan, fan guard, and radiator.	Fan hits fan guard or radiator.

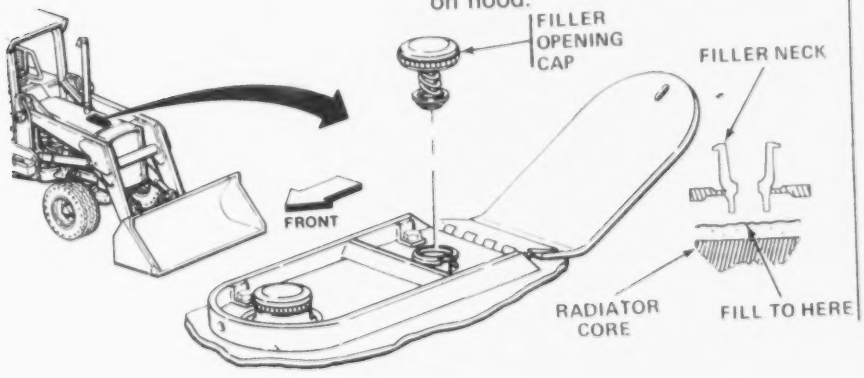


TA234789

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
8	•					RADIATOR Check coolant by doing the following: 1. Lift open cover on hood to access radiator filler opening cap. 2. Unscrew, and take off radiator filler opening cap from radiator filler neck, and check coolant level. **NOTE** Radiator should be filled midway between the radiator core and the filler neck. 3. If coolant is at full level, screw radiator filler opening cap on to filler neck and tighten. Close cover on hood. 4. If level of coolant is below full level fill radiator as required with antifreeze (TM 750-254). Screw radiator filler opening cap onto filler neck and tighten. Close cover on hood.	



TA234790

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

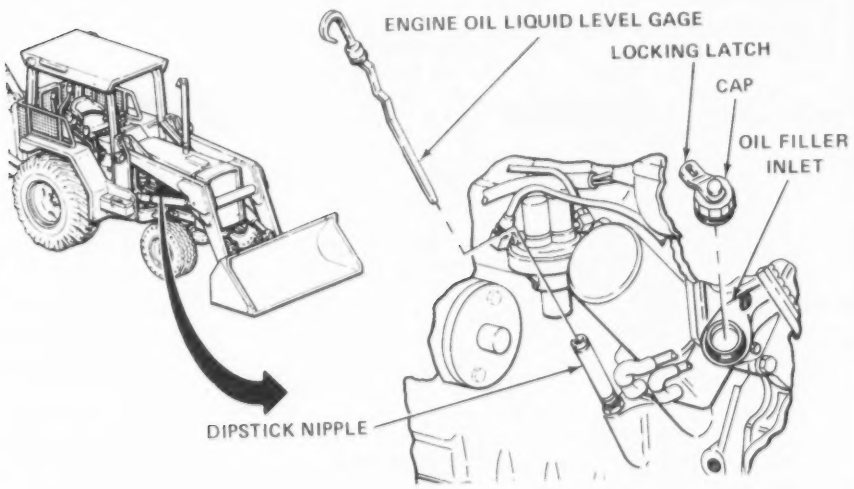
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
9						ENGINE	
	•					a. Check engine oil level by doing the following: 1. Pull engine oil liquid level gage out of dipstick nipple. 2. Wipe engine oil liquid level gage with clean rag. 3. Push engine oil liquid level gage into dipstick nipple as far as it will go. 4. Pull engine oil liquid level gage out of dipstick nipple, and check oil level. 5. If oil level is between safe marks on engine oil liquid level gage, push engine oil liquid level gage into dipstick nipple as far as it will go. Engine oil level is satisfactory for operation. 6. If engine oil level is below safe marks on engine oil liquid level gage, add oil as follows: (a) Pull off, locking latch on oil filler neck and cap, and move aside. (b) Unscrew and take off cap from oil filler neck. **CAUTION** Do not overfill engine with oil.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
9						ENGINE – CONTINUED (c) Pour proper grade of oil (LO 5-2420-222-12) into filler neck until engine oil liquid level gage shows oil level between safe marks. (d) Push engine oil liquid level gage into dipstick nipple as far as it will go. (e) Screw on and tighten oil filler neck cap. (f) Place locking latch in position and push onto oil filler neck and cap. (g) Engine oil level is now satisfactory for operation.	



TA234735

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

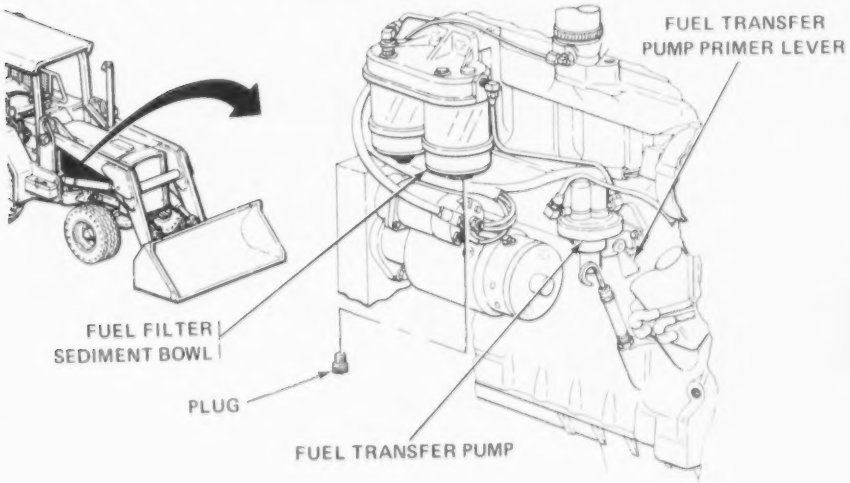
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
9						ENGINE – CONTINUED	
		•				b. Listen to engine for any unusual noises that may indicate malfunction. If any unusual noise is heard, it should be investigated and reported to Organizational Maintenance.	
10						FUEL FILTER SEDIMENT BOWL **NOTE** There are two fuel filter sediment bowls on this vehicle. Some loader backhoes have two glass fuel filter sediment bowls or one glass and one aluminum fuel filter sediment bowl. All are serviced the same way. Right side fuel filter sediment bowl is shown.	
		•				Look in fuel filter sediment bowl for signs of water or dirt deposits. If water or dirt is present do the following: **WARNING** Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when draining fuel filter sediment bowl. Failure to observe these precautions could cause serious injury or death. **NOTE** One 1/2-gallon metal container and one pair slip-joint pliers will be needed, from Organizational Maintenance, to perform this task.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
10	•					FUEL FILTER SEDIMENT BOWL – CONTINUED 1. Place 1/2 gallon metal container under fuel filter sediment bowl being drained. 2. Using slip-joint pliers, unscrew and take out plug. 3. Pull primer lever up as far as it will go and push in several times to pump fuel out of sediment bowl. Leave primer lever in closed position, toward engine. 4. Screw plug in finger tight. 5. Dispose of fuel drained from fuel filter sediment bowl.	

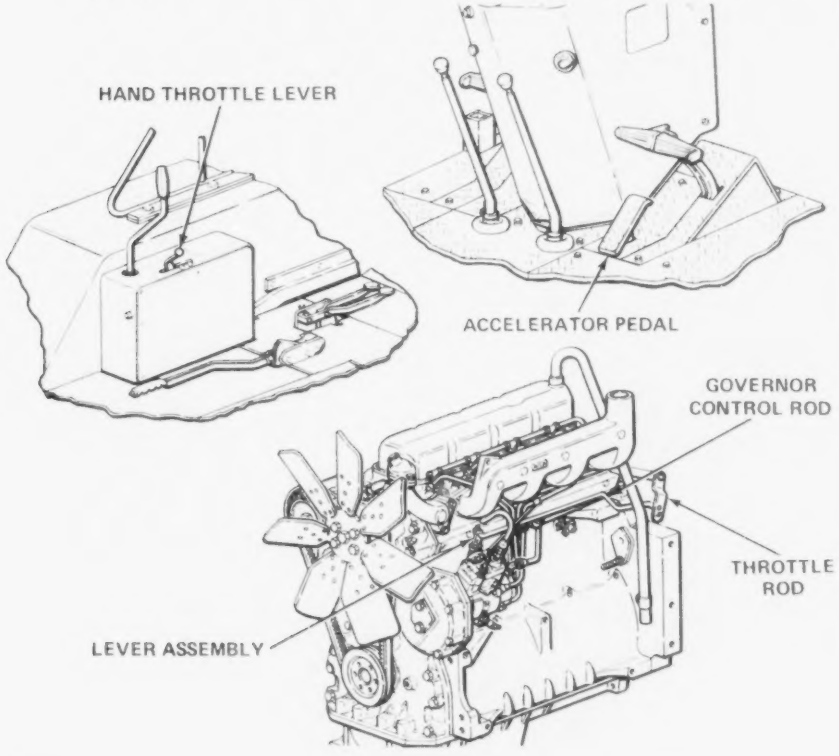


TA234736

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
11						ACCELERATOR AND GOVERNOR CONTROL LINKAGE Check accelerator and governor control linkage by doing the following:	
	•					1. Have an assistant press accelerator pedal to floor. Check governor control linkage and lever assembly for binding, or excessive looseness.	Accelerator or governor control linkage binds or is loose.
						2. Have an assistant move hand throttle lever forward and back. Check governor control linkage and lever assembly for binding, or excessive looseness.	Accelerator or governor control linkage binds or is loose.

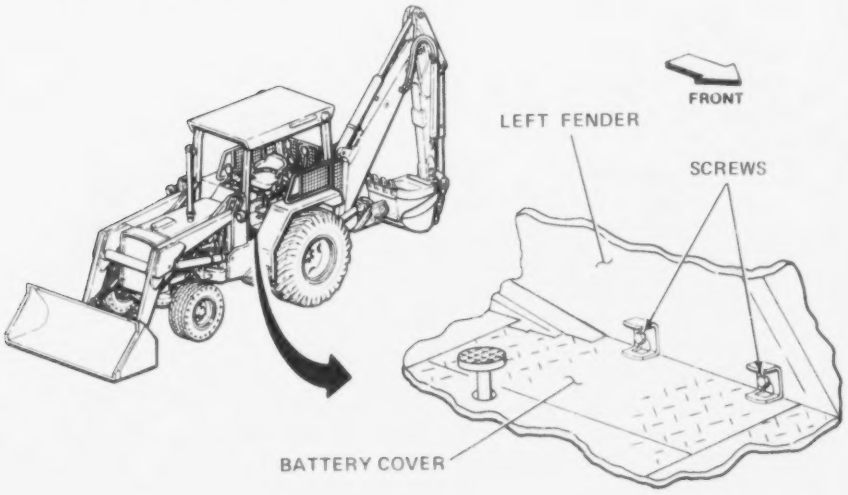


TA234737

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
12				•		BATTERIES a. Check level of electrolyte in both batteries by doing the following: **NOTE** Gravity battery filler and 12-inch adjustable wrench will be needed, from Organizational Maintenance, to complete this task. 1. Using 12-inch adjustable wrench unscrew two screws, on battery cover and left fender, partway.	



TA234738

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

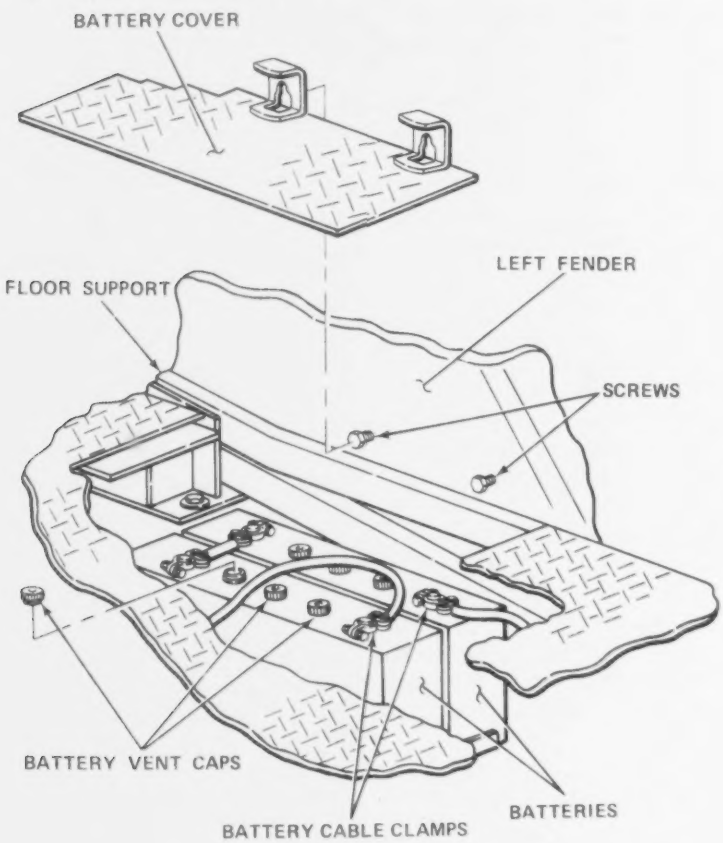
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
12						BATTERIES – CONTINUED **WARNING** Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death. 2. Take off left floor panel. 3. Pull off six battery vent caps. 4. Check that electrolyte level in each cell is even with split ring. If electrolyte level is correct, then push on all vent caps. **CAUTION** In freezing weather, run engine at least 15 minutes after adding water. 5. If electrolyte level is low, using gravity battery filler, add clean water (distilled water if possible) up to level of split ring. Push on all vent caps.	
				•		b. Check four battery cable clamps for tightness. If loose, using 12-inch adjustable wrench, tighten.	
						c. Place battery cover in position on floor support.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
12						BATTERIES – CONTINUED d. Using 12-inch adjustable wrench, tighten two screws on battery cover and left fender.	



TA234739

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

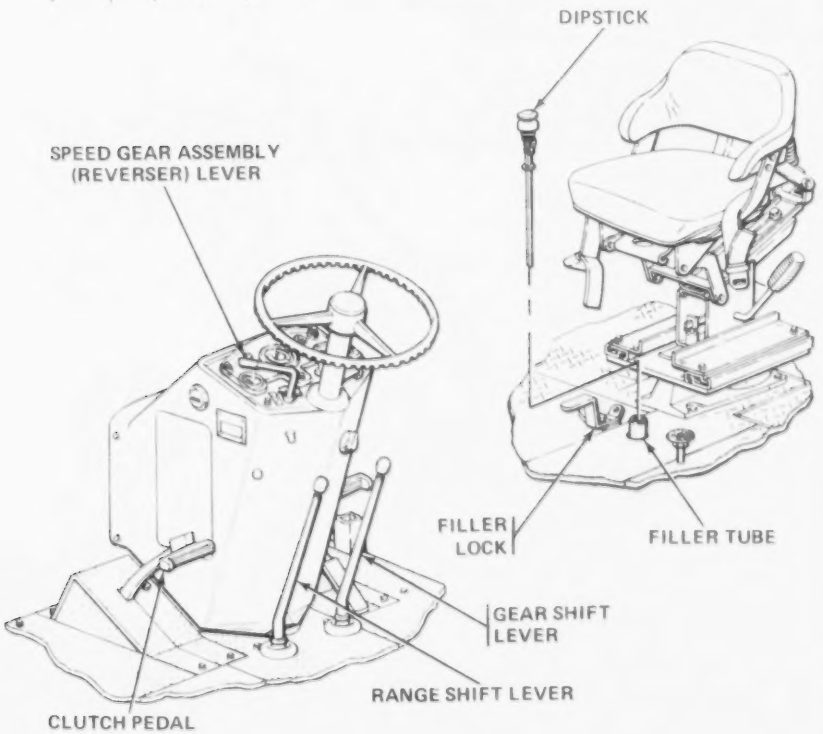
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
13						HYDRAULIC SYSTEM	
				•		Check hydraulic system fluid level by doing the following: 1. Start engine (page 2-61) and let warm up for about five minutes. Make sure speed gear assembly (reverser) lever, range transmission shifter, and gear transmission shifter are in neutral position and clutch is engaged. 2. Move filler lock, over dipstick, aside. 3. Loosen dipstick and pull out of filler tube. 4. Wipe dipstick with clean rag. 5. Push dipstick into filler tube. 6. Pull dipstick out of filler tube and check oil level. 7. If hydraulic oil level is between safe marks on dipstick, push dipstick into filler tube and tighten. Move filler lock back over dipstick. Turn off engine (page 2-67). Hydraulic oil level is satisfactory for operation. **CAUTION** Do not over fill hydraulic system with oil.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
13						HYDRAULIC SYSTEM – CONTINUED 8. If hydraulic oil level is not between safe marks, pour proper grade of oil (LO5-2420-222-12) into filler tube until dipstick shows oil level between safe marks. 9. Push dipstick back into filler tube and tighten. 10. Move filler lock back over dipstick. Turn off engine (page 2-67). Hydraulic oil level is now satisfactory for operation.	



TA234740

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

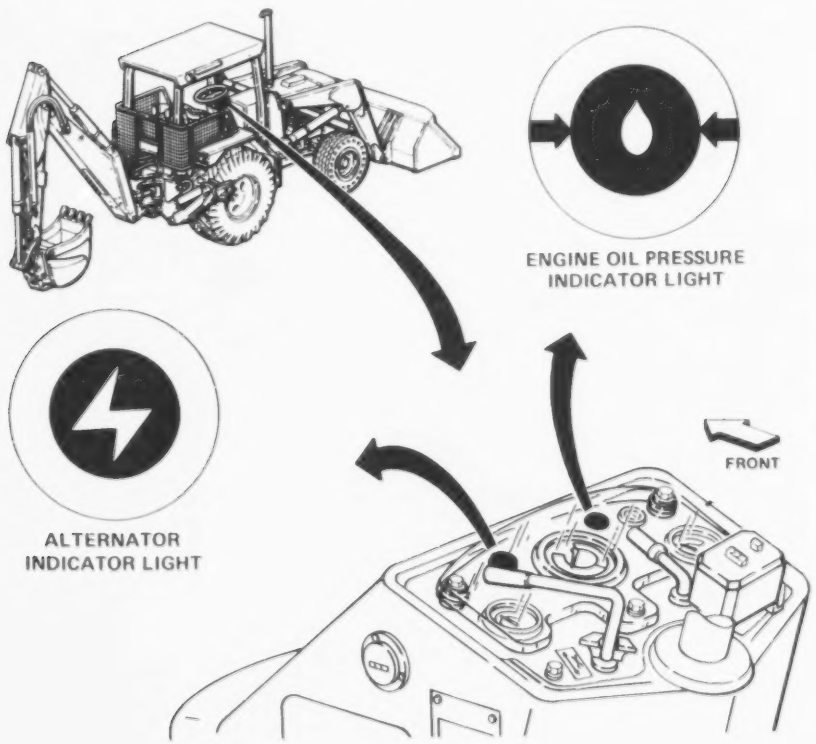
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
14		•				CONTROLS	
						a. While vehicle is moving, apply brakes (page 2-72).	Loader backhoe does not slow down and come to a complete stop.
						b. Apply parking brake (page 2-73).	Parking brake fails to keep loader backhoe from moving.
						c. Raise, lower, dump, and retract loader bucket (page 2-83).	Loader bucket does not raise, dump, or retract.
						d. Lower and raise right and left stabilizers (page 2-91).	Right or left stabilizer does not lower or raise.
						e. Move backhoe boom up, down to right and to left (page 2-92).	Backhoe boom does not move up, down, left or right.
						f. Raise and lower dipperstick, dump and retract backhoe bucket (page 2-92).	Backhoe dipperstick does not raise or lower or backhoe bucket does not dump or retract.
						g. Open and close backhoe jaw bucket (page 2-100).	Backhoe jaw bucket does not open or close.
15						INSTRUMENTS	
		•				a. Check engine oil pressure indicator light. If light is on do the following:	
						1. Shut off engine (page 2-67).	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
15						INSTRUMENTS – CONTINUED	
						2. Check engine oil level (page 3-22).	
						3. If engine oil level is satisfactory and engine oil pressure indicator light stays on, notify Organizational Maintenance.	Engine oil level is satisfactory and engine oil pressure indicator light stays on.
		•				b. Check alternator indicator light. If alternator indicator light does not go out after engine runs ten seconds, or comes on during operation, notify Organizational Maintenance.	Alternator indicator light does not go out after engine runs ten seconds, or comes on during operation.

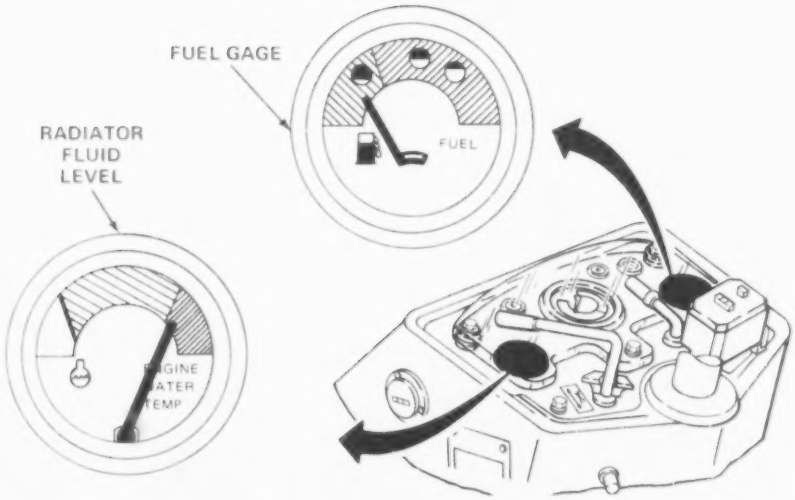


TA234741

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
15						INSTRUMENTS – CONTINUED	
		•				c. Check engine coolant temperature gage. If gage registers in overheat range do the following: 1. Shut down engine (page 2-67) and let cool. 2. Check radiator fluid level (page 3-41). 3. If radiator fluid level is satisfactory and engine continues to run in overheat range, notify Organizational Maintenance.	Radiator fluid level is satisfactory and engine continues to run in the overheat range.
		•	•			d. Check fuel gage for fuel, if fuel gage shows low, or operation of loader backhoe is complete, fill fuel tank (page 3-32).	

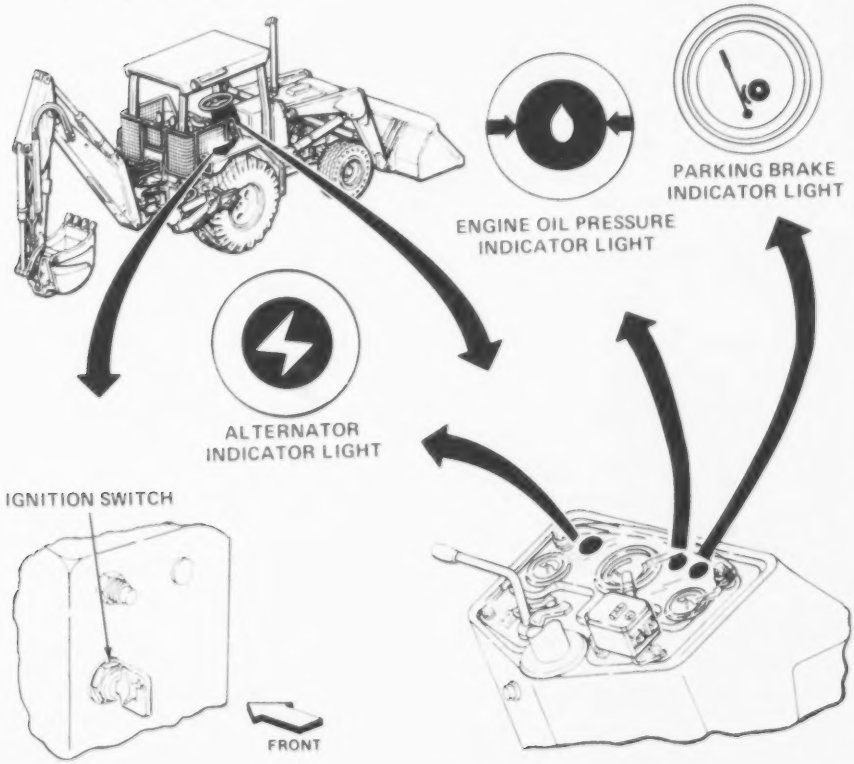


TA234742

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
16	•					LIGHTS a. Check the alternator, battery, and parking brake dash warning lights by doing the following: 1. Place ignition key in ignition switch and turn on. 2. Check that alternator, battery, and parking brake dash warning lights illuminate. If any light is found bad, notify Organizational Maintenance.	Warning lights do not illuminate.



TA234743

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

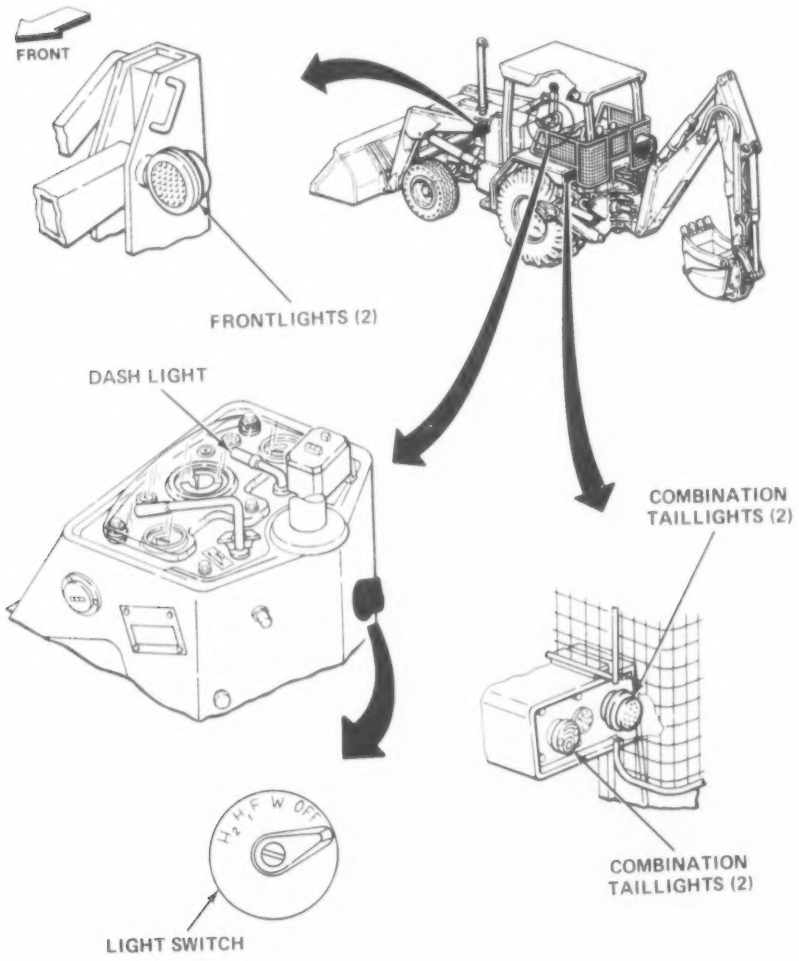
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL					ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
	B	D	A	W	M		
16						LIGHTS – CONTINUED	
		•				b. Check front lights and combination taillights by doing the following:	
						1. Turn light switch to second position, F.	
						2. Check that front lights illuminate high beam, rear floodlights, and dash light are also on. If any light is found bad, notify Organizational Maintenance.	High beam headlights, rear floodlights, or dash lights do not illuminate.
						3. Turn light switch to third position, H1.	
						4. Check that front lights illuminate high beam, rear taillight, and dash light are also on. If any light is found bad, notify Organizational Maintenance.	High beam headlights, rear taillights, or dash lights do not illuminate.
						5. Turn light switch to fourth position, H2.	
						6. Check that front lights are on in low beam, rear taillights, and dash light are also on. If any light is found bad, notify Organizational Maintenance.	Low beam headlights, rear taillights, or dash lights do not illuminate.
						c. Check brake lights by doing the following:	
						1. Push down on right and left brake pedals.	

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
16						LIGHTS – CONTINUED 2. Check that rear taillights illuminate. If any lights are found bad, notify Organizational Maintenance.	Rear taillights do not illuminate.

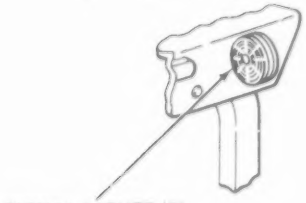


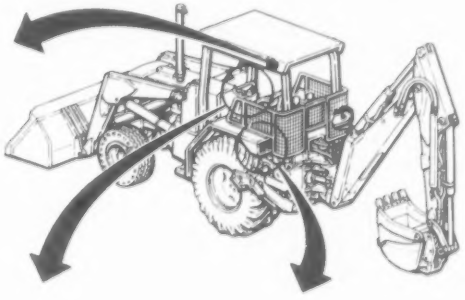
TA234744

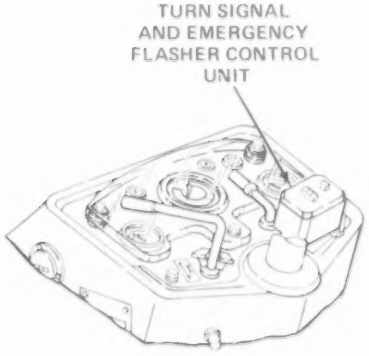
OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

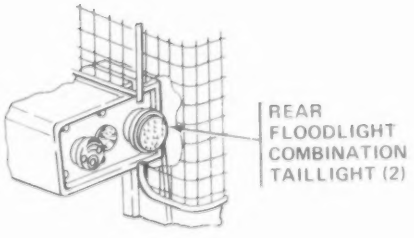
B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
16		•				LIGHTS – CONTINUED d. Check turn signal and warning lights by doing the following: 1. Push in top button of turn signal and emergency flasher control unit for left turn signal, bottom button for right turn signal, and both buttons simultaneously for emergency flashers. 2. Check that right and left turn signals and rear floodlight combination taillights are flashing individually and simultaneously. If any are found bad, notify Organizational Maintenance.	







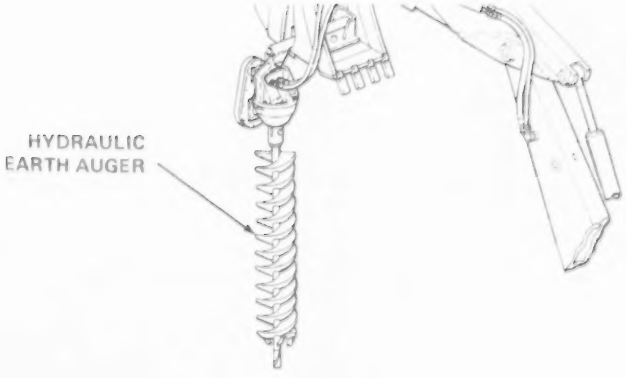


TA234745

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
17						AUXILIARY EQUIPMENT	
					•	a. Check hydraulic earth auger, lines, hoses, and connections for fluid leaks as follows:	
						1. Install hydraulic earth auger (page 2-100).	
						2. Operate hydraulic earth auger for approximately two hours (page 2-106).	
						3. Listen for any unusual noises such as grinding, or loud humming noise from gears. If any of these conditions are present, notify Organizational Maintenance.	Unusual noises such as grinding or loud humming noise from gears are present.
						4. Check hydraulic earth auger, lines, hoses, and connections for fluid leaks.	You have Class III leaks (page 2-12).
						5. Remove hydraulic earth auger (page 2-104).	

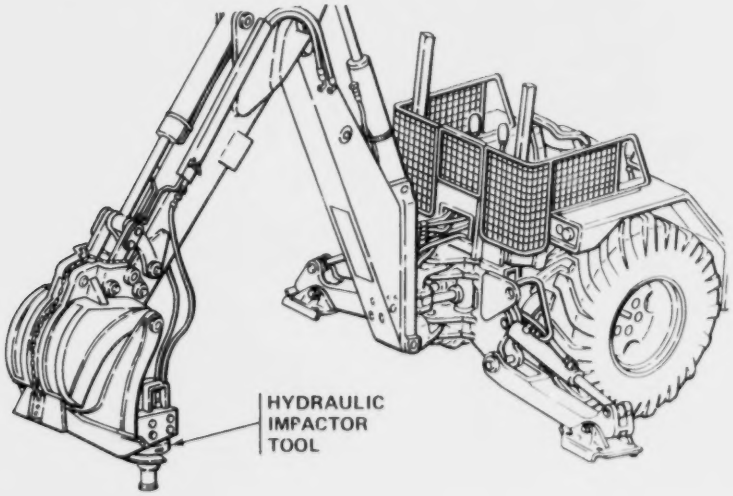


TA234746

OPERATOR/CREW PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) – CONTINUED

B – BEFORE D – DURING A – AFTER W – WEEKLY M – MONTHLY

ITEM NO.	INTERVAL B	D	A	W	M	ITEM TO BE INSPECTED PROCEDURE: CHECK FOR AND HAVE REPAIRED, FILLED, OR ADJUSTED AS NEEDED	EQUIPMENT IS NOT READY/AVAILABLE IF:
17						AUXILIARY EQUIPMENT – CONTINUED	
					•	b. Check hydraulic impactor tool, lines and connections for fluid leaks as follows:	
						1. Install hydraulic impactor tool (page 2-107).	
						2. Operate hydraulic impactor tool for approximately two hours (page 2-112).	
						3. Check hydraulic impactor tool lines and connections for fluid leaks.	You have Class III leaks (page 2-12).
						4. Remove hydraulic impactor tool (page 2-110).	



TA234747

Section III. OPERATION UNDER USUAL CONDITIONS

WARNING

Read all operating instructions in this section completely before operating loader backhoe. Failure to follow these instructions could cause serious injury or death.

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available

PREPARE FOR OPERATION

WARNING

Hearing protection must be worn when operating loader backhoe. Failure to observe this precaution could cause hearing loss.

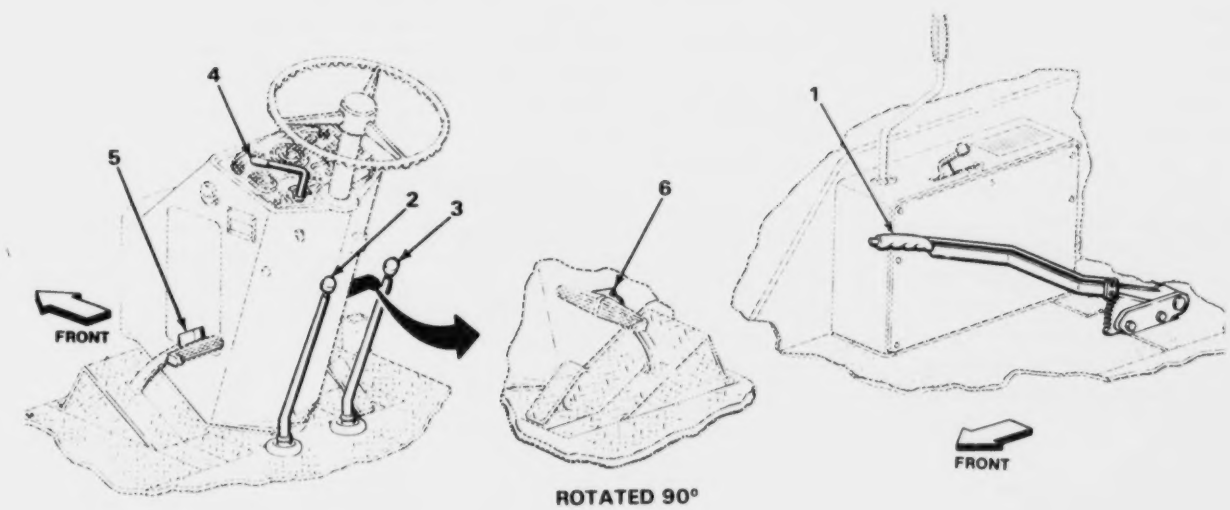
CAUTION

Before loader backhoe can be operated, backhoe lockpins must be removed (page 2-123). Preservative covers must also be removed (page 2-122).

NOTE

If engine is too cold for easy starting and loader backhoe is equipped with engine coolant heater, heat engine with engine coolant heater (page 2-135).

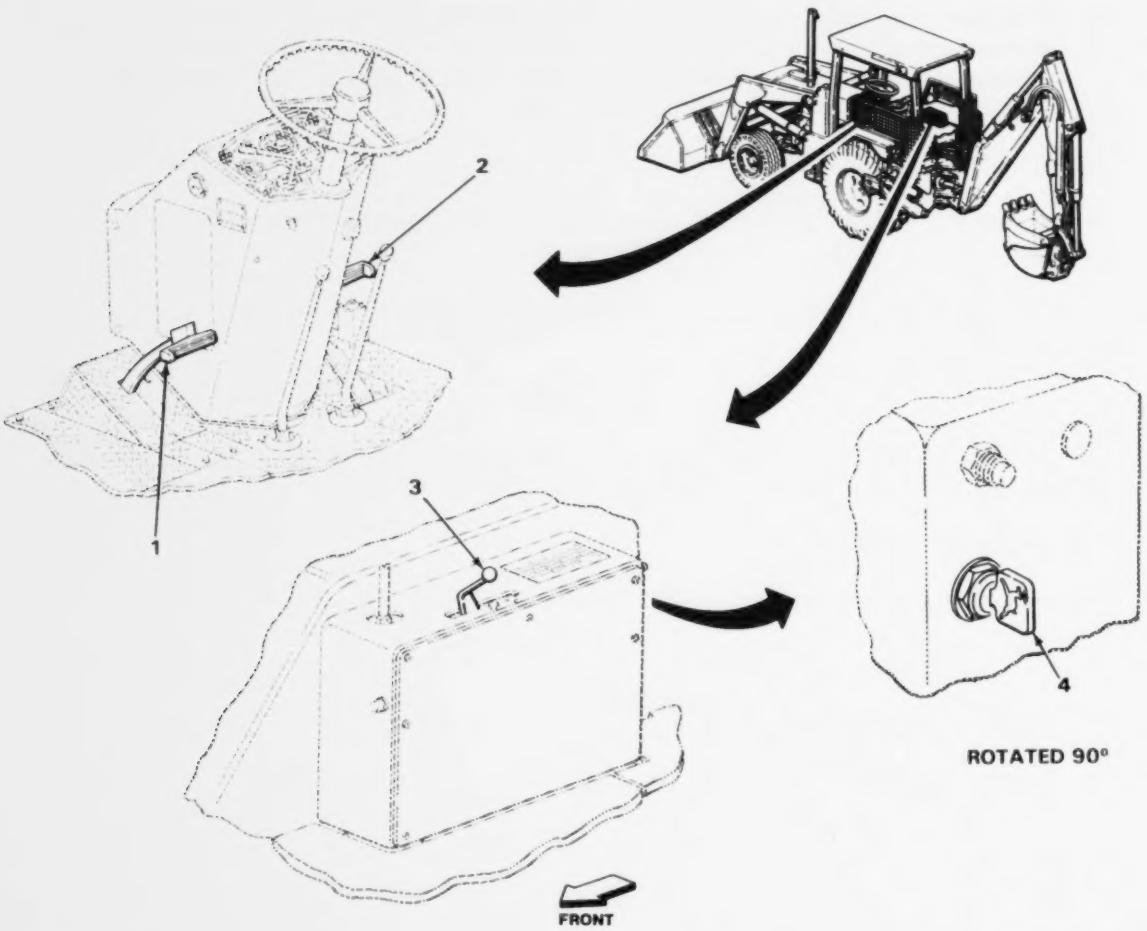
1. Perform Preventive Maintenance Checks and Services (PMCS) (page 2-10).
2. Make sure parking brake is applied by pulling parking brake lever (1) up as far as it will go.
3. Make sure range shift lever (2) and gear shift lever (3) are both in neutral.
4. Make sure speed gear assembly (reverser) control lever (4) is in neutral position.
5. Make sure clutch pedal stop (5) is in up position.
6. Make sure brake pedal lock (6) is down in lock position.
7. Fasten seat belt (page 2-81).



TA234748

STARTING AT TEMPERATURES ABOVE 32°F (0°C)

1. Prepare for operation (page 2-60).
2. Push clutch pedal (1) down as far as it will go.
3. Push down on brake pedals (2).
4. Place hand throttle (3) at approximately 1/3 open throttle position, approximately 1200 rpm once engine is started.
5. Place key in ignition switch (4) and turn clockwise.



TA234749

STARTING AT TEMPERATURES ABOVE 32°F (0°C) - CONTINUED

WARNING

CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU

Carbon monoxide is without color or smell, but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when loader backhoe engine is operated for any purpose.

- DO NOT operate loader backhoe engine in a closed place unless the place has a lot of moving air.
- BE ALERT at all times during loader backhoe operation for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY VENTILATE. If symptoms persist, remove affected crew to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

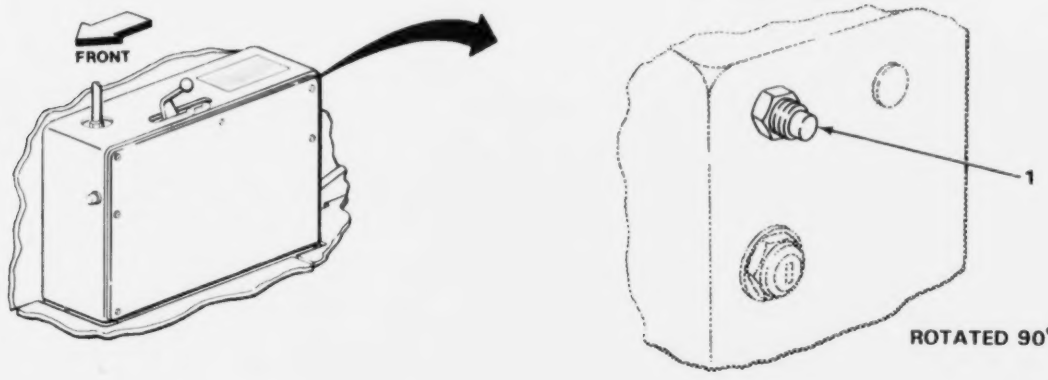
- BE AWARE; the field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

CAUTION

Do not operate electric starting motor for more than 20 seconds at a time. Allow two minutes for cooling before using starter again to prevent overheating.

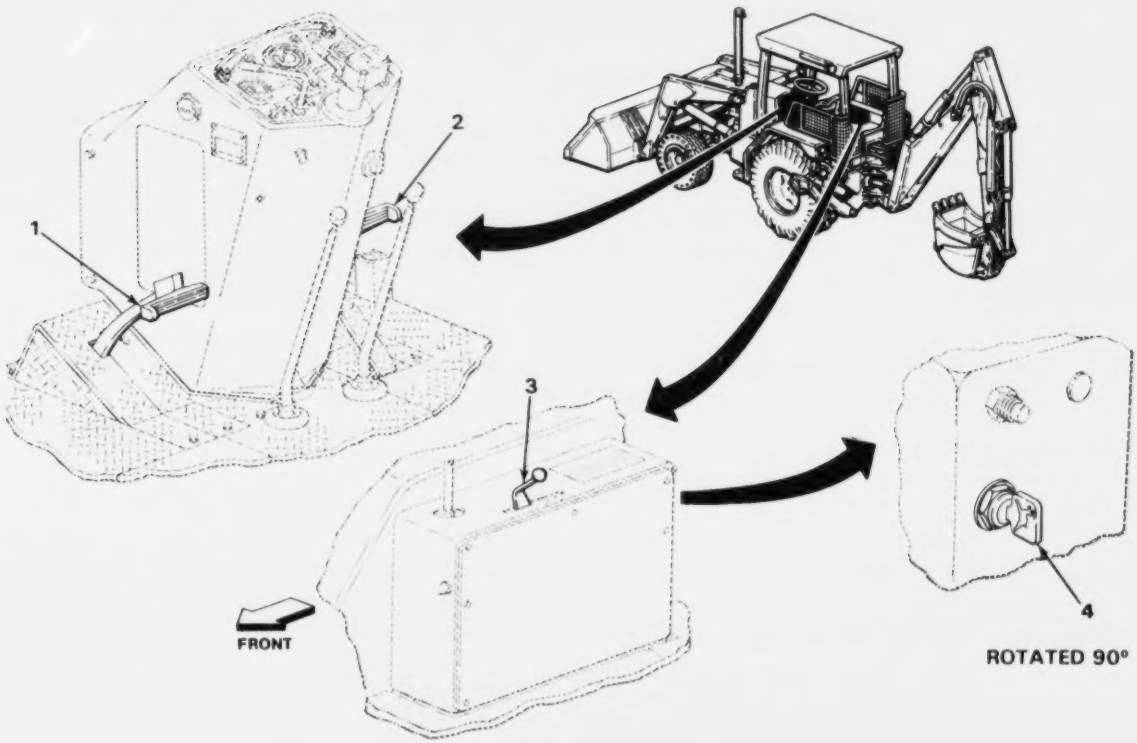
6. Push starter button (1) in.
7. When engine starts, release starter button (1) and go to Engine Warmup (page 2-66).



TA234750

STARTING AT TEMPERATURES BELOW 32°F (0°C)

1. Prepare for operation (page 2-60).
2. Push clutch pedal (1) down as far as it will go.
3. Push down on brake pedals (2).
4. Place hand throttle (3) at approximately 1/3 open throttle position, approximately 1200 rpm once engine is started.
5. Place key in ignition switch (4) and turn clockwise.



TA234751

STARTING AT TEMPERATURES BELOW 32°F (0°C) - CONTINUED

WARNING

CARBON MONOXIDE (EXHAUST GAS) CAN KILL YOU

Carbon monoxide is without color or smell, but can kill you. Breathing air with carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no air movement. Precautions must be followed to insure crew safety when loader backhoe engine is operated for any purpose.

- DO NOT operate loader backhoe engine in a closed place unless the place has a lot of moving air.
- BE ALERT at all times during loader backhoe operation for exhaust odors and exposure symptoms. If either is present, IMMEDIATELY VENTILATE. If symptoms persist, remove affected crew to fresh air; keep warm; DO NOT PERMIT PHYSICAL EXERCISE; if necessary, give artificial respiration.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 21-11.

- BE AWARE; the field protective mask for chemical-biological-radiological (CBR) protection will not protect you from carbon monoxide poisoning.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

CAUTION

Do not operate electric starting motor for more than 20 seconds at a time. Allow two minutes for cooling before using starter again to prevent overheating.

6. Push starter button (1) in.

NOTE

If engine starts, go to step 7. If engine does not start, go to step 8.

7. Release starter button (1), and go to Engine Warmup (page 2-66).

STARTING AT TEMPERATURES BELOW 32°F (0°C) - CONTINUED

WARNING

Ether is highly flammable. Be careful when using ether starting aid. If ether discharger is being used for testing, demonstration, or other purposes and is not installed on the engine, do not use in closed spaces or near an open flame. Failure to observe these precautions could cause serious injury or death.

CAUTION

Do not use ether starting aid if outside temperatures is above 32°F (0°C). Do not operate ether starting aid while cranking engine or when engine is running. Failure to observe these precautions could cause damage to engine.

8. Press starting aid button (2) one time.

CAUTION

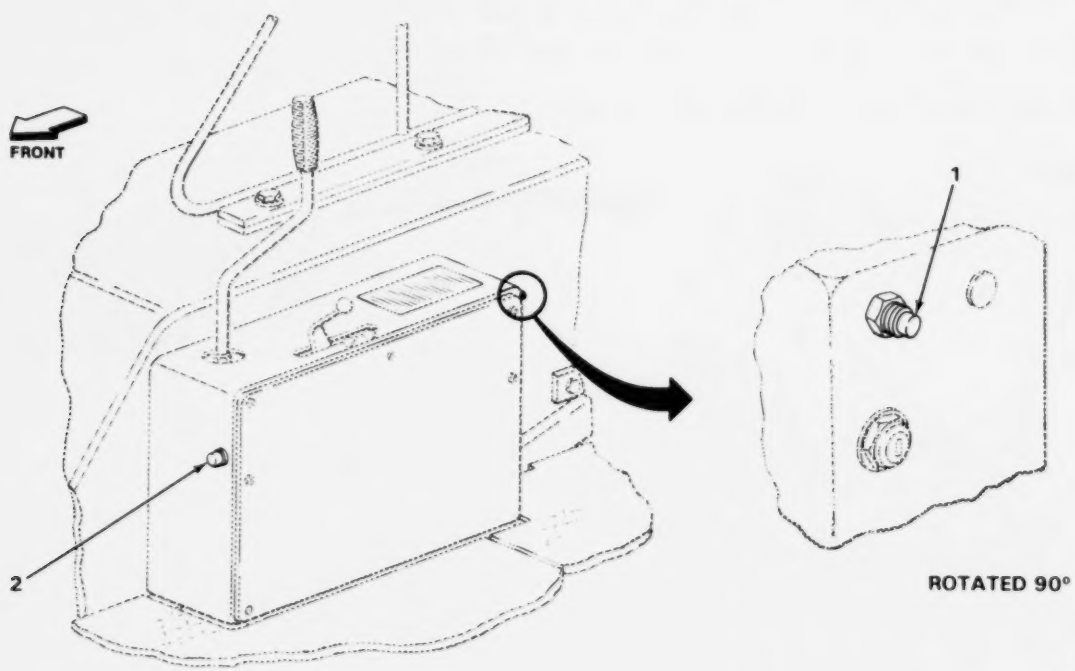
Do not operate electric starter motor for more than 20 seconds at a time. Allow two minutes for cooling before using starter again to prevent overheating.

9. Push in starter button (1).

NOTE

If engine starts, go to step 10. If engine does not start, repeat steps 8 and 9.

10. Release starter button (1) and go to Engine Warmup (page 2-66).



TA234752

ENGINE WARMUP

1. Place hand throttle (1) at approximately 1/2 open throttle position, approximately 1700 rpm.

CAUTION

If either engine oil pressure indicator light or alternator indicator light are still on ten seconds after engine has started, shut down engine (page 2-67) and notify Organizational Maintenance.

2. Watch gages to make sure engine oil pressure indicator light (2) and alternator indicator light (3) are not lit.

3. Be sure to keep range shift lever (4), gear shift lever (5), and speed gear assembly (reverser) control lever (6) in neutral position.

4. Release clutch pedal (7) for warmup.

5. Push clutch pedal stop (8) down for normal operation.

WARNING

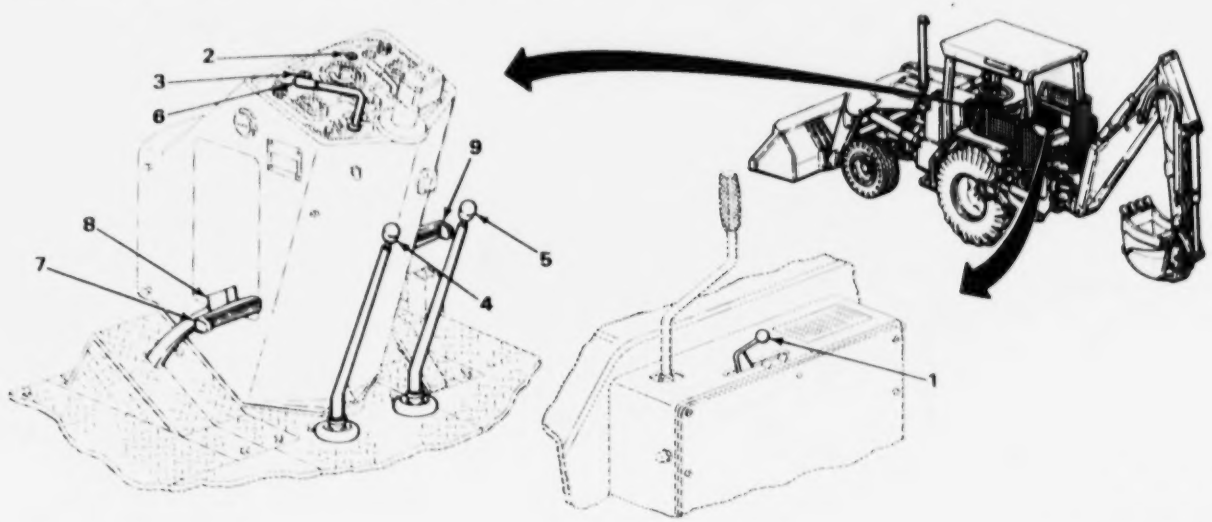
Keep parking brake engaged during warmup to prevent loader backhoe from rolling. Failure to observe this precaution may result in serious injury or death.

6. Release foot from service brake pedals (9).

7. Let engine run for five minutes.

8. Move hand throttle (1) back so engine idles, approximately 800 rpm.

9. Engine is now ready to operate loader backhoe.



TA234753

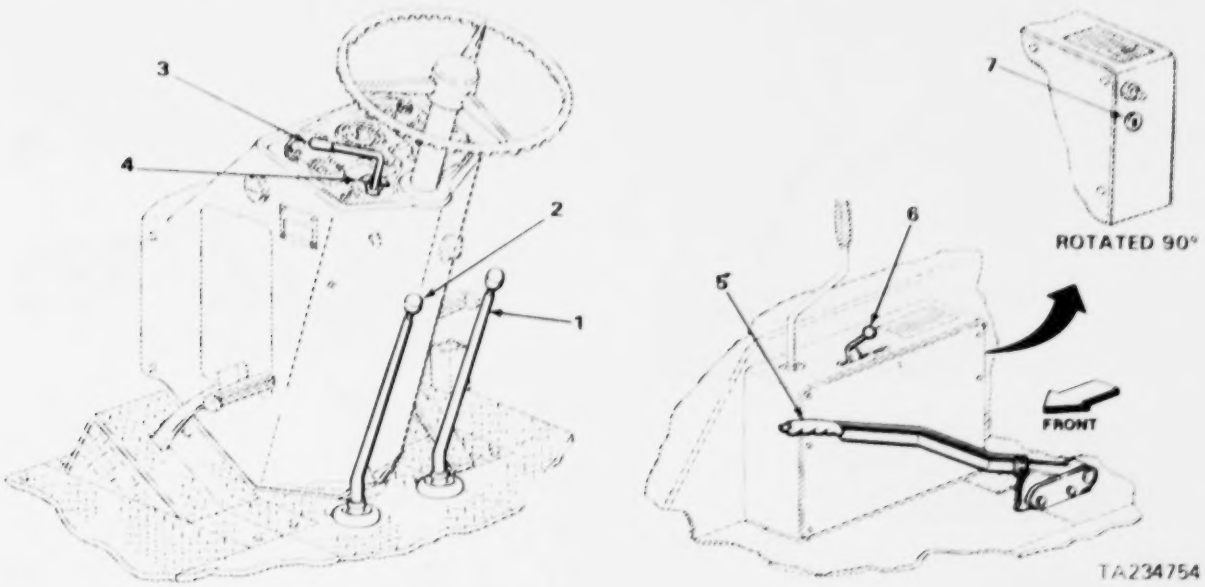
ENGINE SHUTDOWN

1. Bring loader backhoe to a stop by stepping on service brake (page 2-72).
2. Move gear shift lever (1) to neutral position.
3. Move range shift lever (2) to neutral position.
4. Move speed gear assembly (reverser) control lever (3) to neutral position and push down on lock (4).
5. Pull parking brake lever (5) up as far as it will go.
6. Release service brake (page 2-72).

CAUTION

Lower loader bucket and backhoe bucket to ground before leaving loader backhoe to prevent damage to hydraulic system.

7. Lower loader bucket (page 2-83) until it touches the ground.
8. Lower backhoe bucket (page 2-92) until it touches the ground.
9. Place hand throttle (6) at approximately 1/3 open throttle position, approximately 1200 rpm and let engine run for five minutes.
10. Pull hand throttle (6) all the way back to closed position, approximately 800 rpm and let engine idle for 15 seconds.
11. Turn ignition key counterclockwise to off position and remove from ignition switch (7).
12. Unbuckle seat belt (page 2-81).



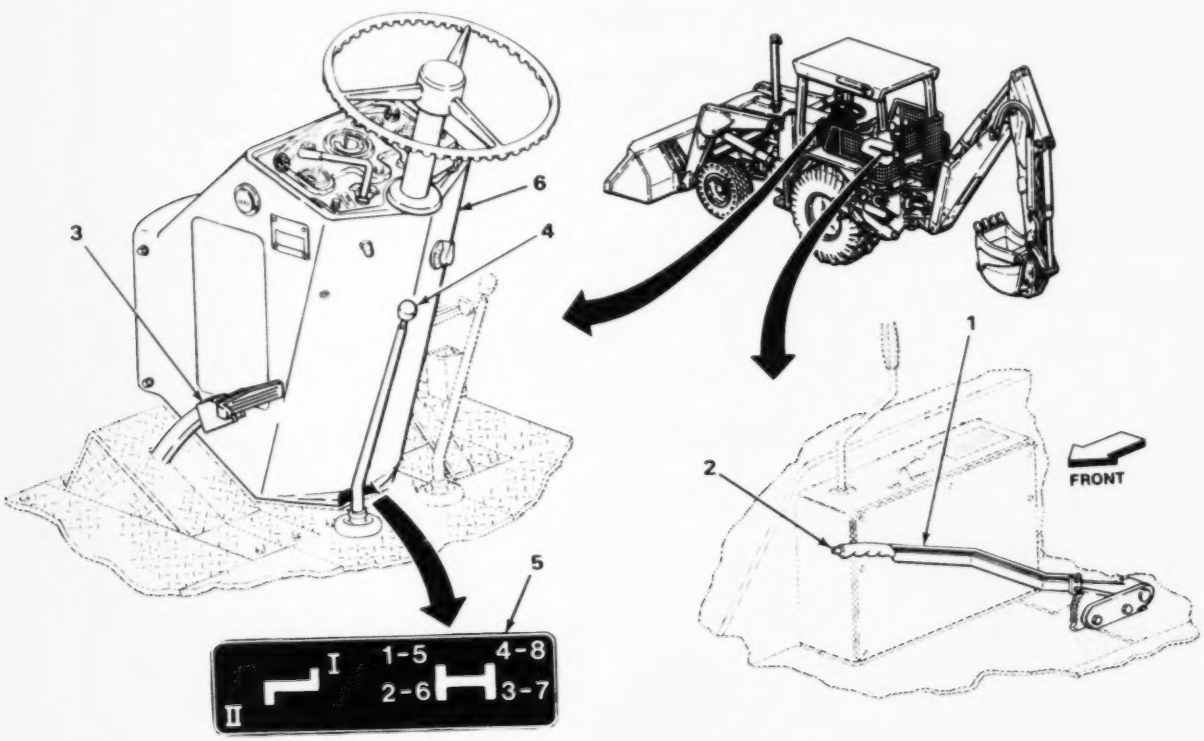
SHIFTING TRANSMISSION INTO RANGE

NOTE

Loader backhoe must be fully stopped, service brakes applied (page 2-72), before transmission can be shifted to another range.

Parking brake lever must be released before range shift lever is moved from neutral or horn will sound.

1. Release parking brake lever (1) by pushing in on parking brake lever release button (2) and lowering parking brake lever (1) to cab floor.
2. Push down on clutch pedal (3).
3. Shift transmission range shift lever (4) to either low range (I) or high range (II), noting shifting pattern decal (5) on bottom of cowl (6).
4. Shift transmission into gear (page 2-69).



TA23475

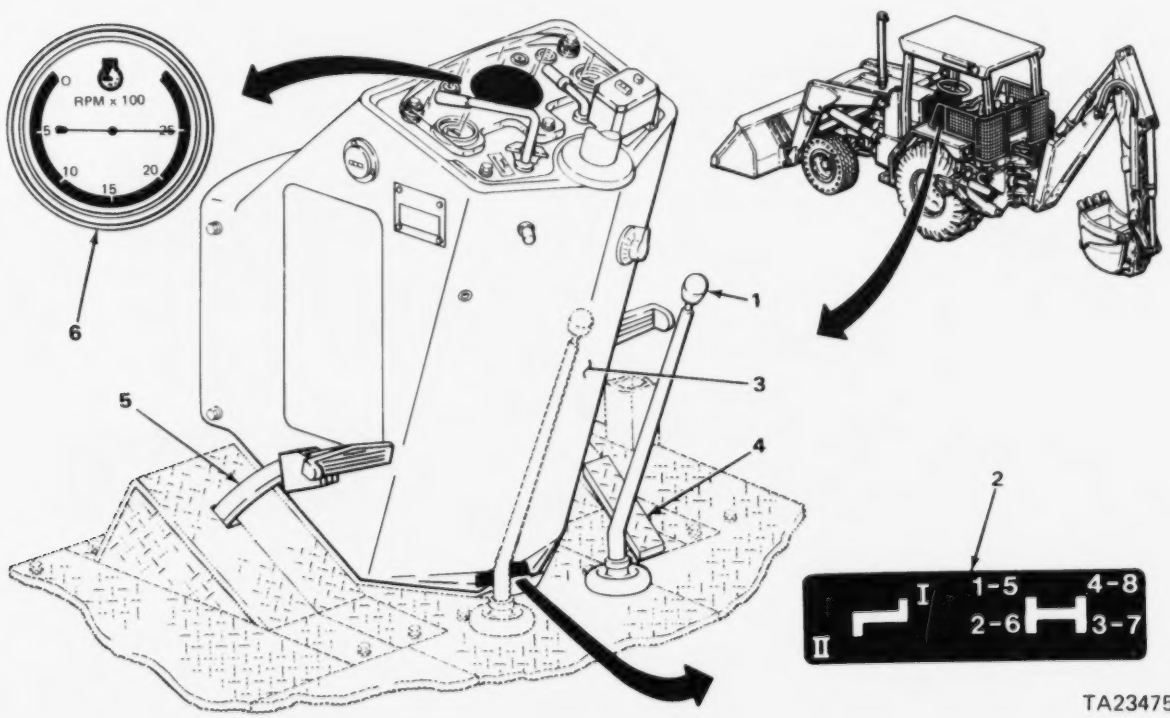
SHIFTING TRANSMISSION INTO GEAR (LOADER BACKHOE STOPPED)

1. Raise loader bucket (page 2-83) high enough for good ground clearance, but low enough for good visibility.
2. Raise backhoe bucket (page 2-92).
3. Raise stabilizers (page 2-91).

NOTE

It is not necessary to start in first gear. Use highest speed which will permit engine to assume load.

4. Shift transmission into desired range (page 2-68).
5. Shift transmission gear shift lever (1) to desired gear, noting shifting pattern decal (2) on bottom of cowl (3).
6. If speed gear assembly (reverser) is not already in gear, shift speed gear assembly (reverser) control lever into gear (page 2-71).
7. Press foot throttle (4) to control engine speed.
8. Slowly release clutch foot control (5) to engage clutch.
9. Watch tachometer (6) and operate engine at a governed full load speed of 2500 rpm.



TA234756

SHIFTING TRANSMISSION INTO GEAR (LOADER BACKHOE MOVING)

1. Press foot throttle (1) to control engine speed.
2. Watch tachometer (2) and operate engine at governed full load speed of 2500 rpm.

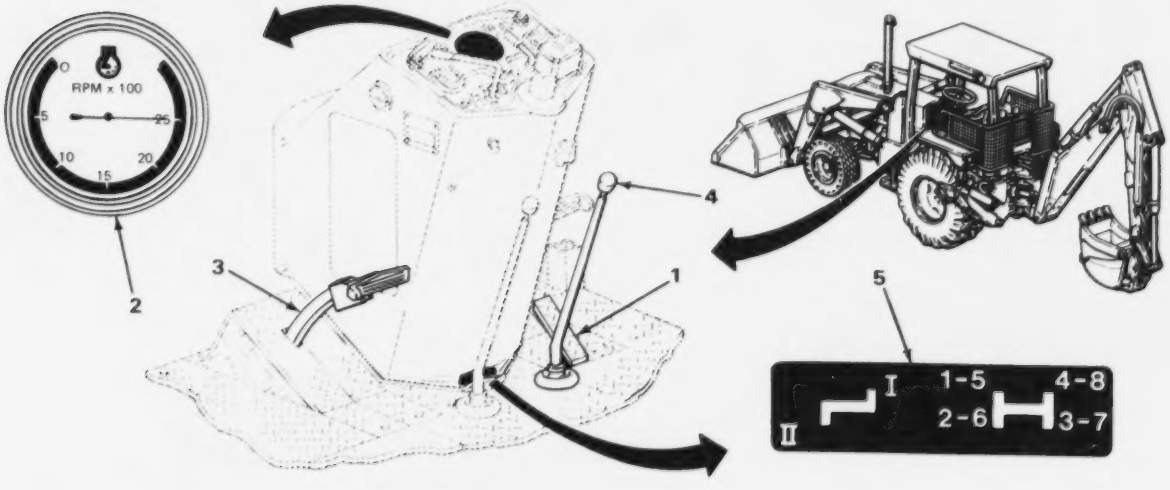
WARNING

Downshift only one gear at a time. Under coasting conditions, do not downshift until tachometer indicates 800 rpm or less. Personal injury may result due to sudden reduction in loader backhoe speed if an improper shift is made.

NOTE

When accelerating under load, upshift to next higher gear when tachometer indicates over 2500 rpm.

3. Push down on clutch pedal (3) while releasing foot throttle (1).
4. Move gear shift control lever (4) out of gear and let up on clutch pedal (3).
5. Push down on clutch pedal (3) and press on foot throttle (1) while shifting gear shift control lever (4) to desired gear, noting shifting pattern decal (5) on bottom of cowl.
6. Let up on clutch pedal (3) to engage clutch into shifted gear.



TA234757

SPEED GEAR ASSEMBLY (REVERSER) SHIFTING

NOTE

Speed gear assembly (reverser) control lever allows direction of travel of loader backhoe to be changed while machine is moving. This can be done without using clutch or shifting gears.

Loader backhoes with Serial Numbers 235786 thru 235999 have a high speed lockout which will not allow speed gear assembly (reverser) shifting into reverse while main transmission is in "high" range, 5th gear or above.

Loader backhoes with Serial Numbers 319995 thru 342573 do not have high speed lockout and will allow speed gear assembly (reverser) shifting into reverse while main transmission is in "high" range, 5th gear or above.

1. Push down on upper tabs of speed gear assembly (reverser) control lever lock (1) and pivot upward to unlock position.

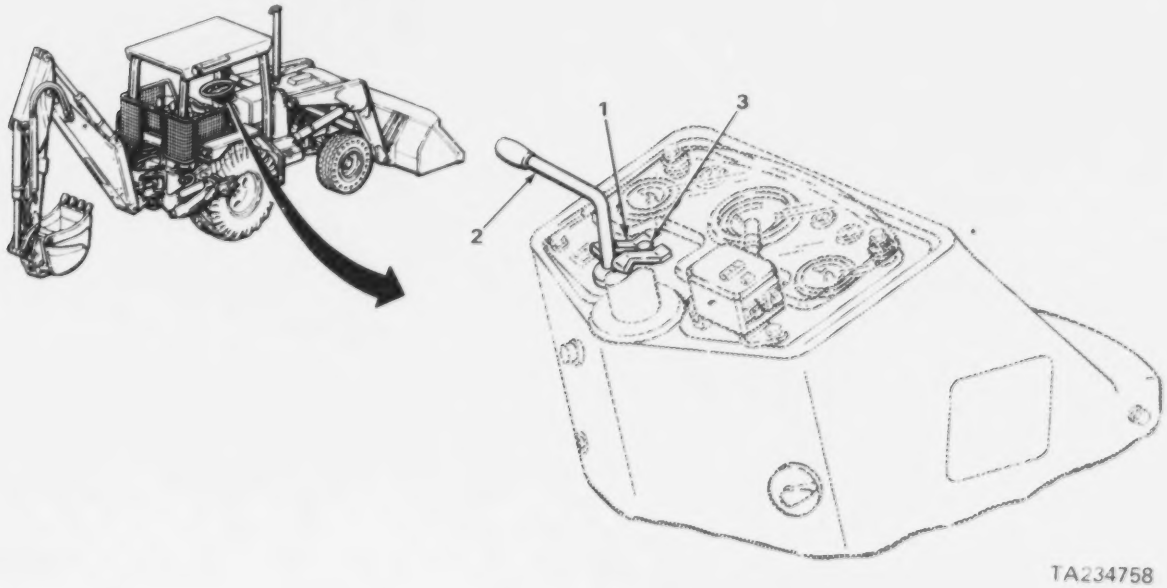
2. Push speed gear assembly (reverser) control lever (2) forward for loader backhoe forward travel.

WARNING

Reverse speeds are 16 per cent faster than forward speeds. Be careful when shifting or traveling in reverse. Personal injury may result due to sudden change in direction of loader backhoe when speed has been increased.

3. Pull speed gear assembly (reverser) control lever (2) back past neutral for loader backhoe reverse travel.

4. Push speed gear assembly (reverser) control lever (2) forward to neutral and push lock (1) down over pin (3).



TA234758

SERVICE BRAKES

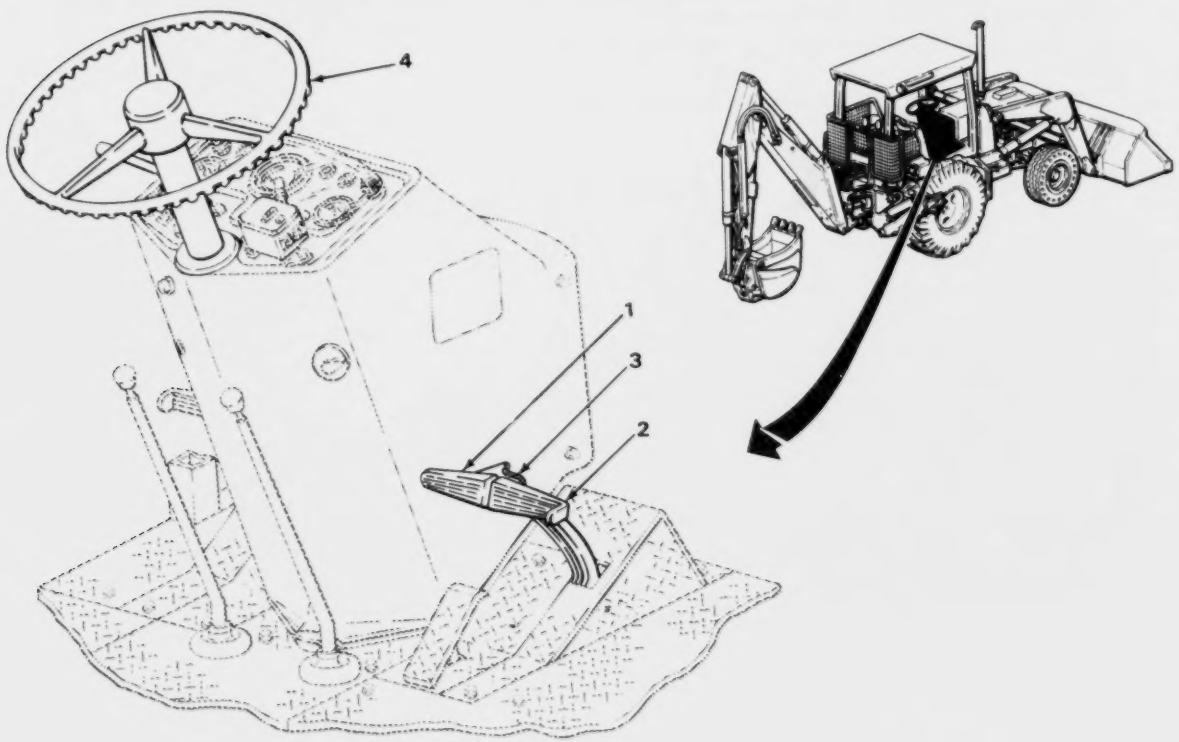
WARNING

Brake pedal lock should be left in locked position when traveling at high speeds or on open road. If brakes are applied and brake pedal lock is unlocked, braking action will be for one side only, and could cause serious injury to personnel.

NOTE

Unlock brake pedal lock when tight, brake assisted maneuvering turns must be done.

1. When brake pedals (1) and (2) are applied with brake pedal lock (3) in locked position, both brakes will be activated simultaneously.
2. When using brakes for tight maneuvering turns, unlock brake pedal lock (3).
3. To turn left, turn steering wheel (4) to the left and apply pressure to left brake pedal (1) only. Loader backhoe will pivot left on left rear wheel.
4. To turn right, turn steering wheel (4) to the right and apply pressure to right brake pedal (2) only. Loader backhoe will pivot right on right rear wheel.



TA234759

PARKING BRAKE

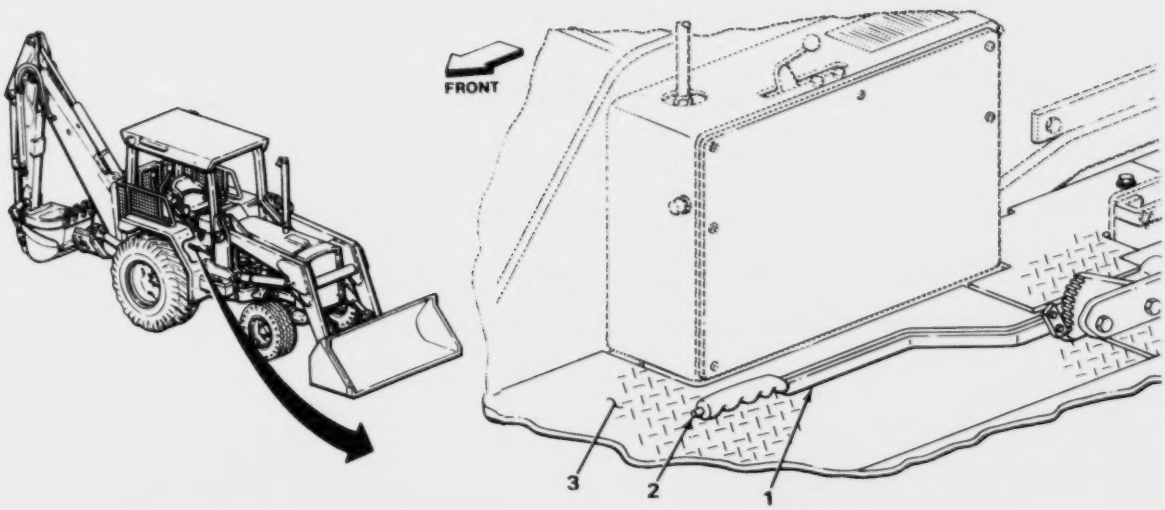
WARNING

Keep parking brake lever in applied position at all times when loader backhoe is parked to prevent loader backhoe from rolling and causing injury to personnel.

NOTE

Parking brake warning horn will sound if engine is running with parking brake engaged and range shift lever is moved from neutral position.

1. To apply parking brake, pull parking brake lever (1) up as far as it will go.
2. To release parking brake, push in on parking brake lever release button (2) and lower parking brake lever (1) to cab floor (3).



TA234760

HAND THROTTLE

NOTE

Loader backhoe engine must be running (page 2-61) for hand throttle to show change in engine rpm.

Hand throttle is primarily used for starting and backhoe operations. It is not intended for use with loader operations.

1. Push hand throttle (1) forward until it hits intermediate stop.
2. Look at tachometer (2), engine speed should be approximately 2200 rpm.
3. Pull hand throttle (1) back as far as it will go.
4. Look at tachometer (2), engine speed should be approximately 800 rpm.

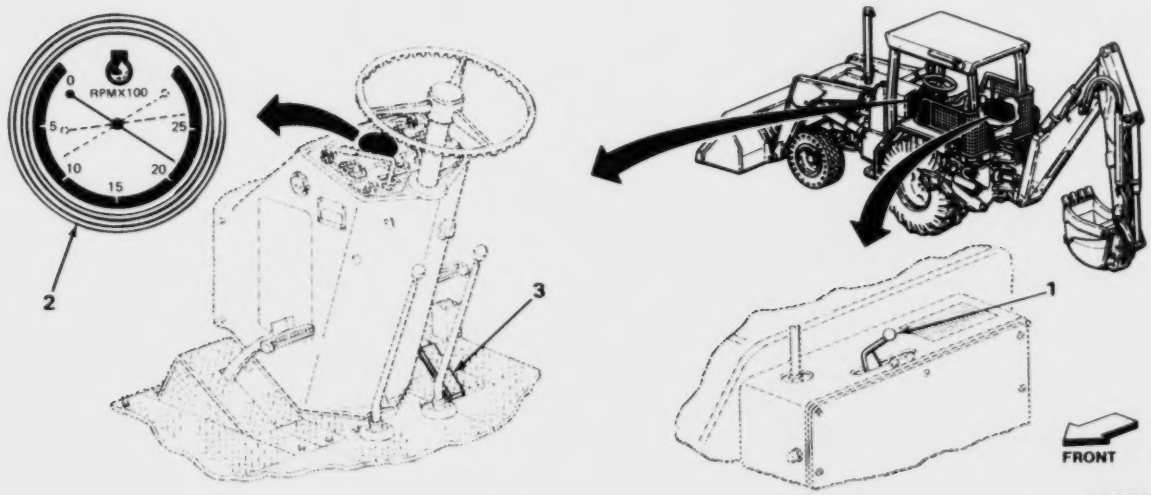
FOOT THROTTLE

NOTE

Loader backhoe engine must be running (page 2-61) for foot throttle to show change in engine rpm.

Once foot throttle is released engine rpm will go back to hand throttle setting.

1. Pull hand throttle (1) back as far as it will go and release foot throttle (3).
2. Look at tachometer (2), engine speed should be approximately 800 rpm.
3. Press foot throttle (3) down as far as it will go.
4. Look at tachometer (2), engine speed should be approximately 2650 rpm.



TA234761

STEERING

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulically assisted steering system to operate.

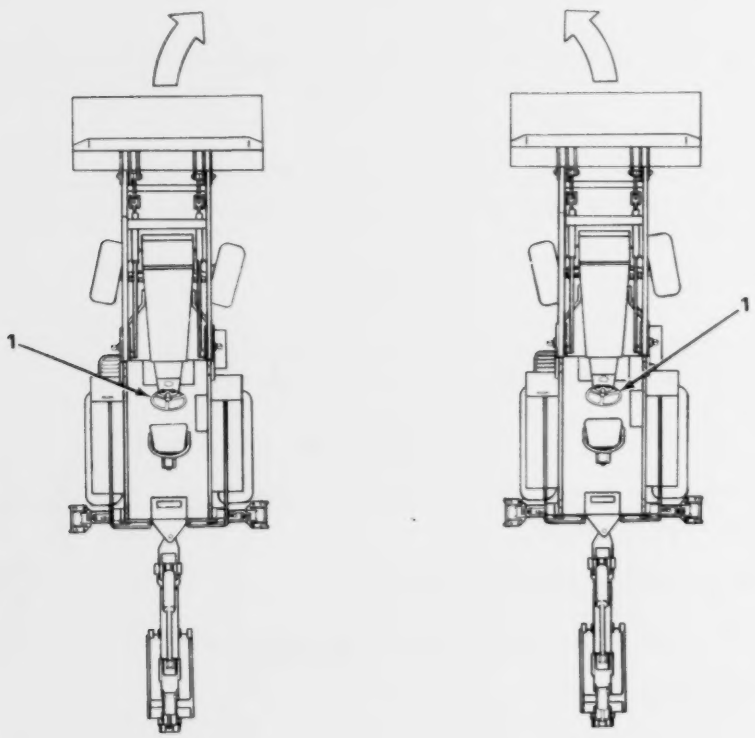
Steering system is still operational if engine does not run, however, with a greater degree of difficulty.

1. Use both hands to steer vehicle. Grip steering wheel (1) firmly, but not tightly.
2. Always round a corner or make any other turns at low speed, being ready for possible errors or unsafe maneuvers by other drivers or pedestrians.
3. Change lanes gradually. Do not turn sharply. Give a turn signal (page 2-80) and look for traffic that may be coming up from behind.

CAUTION

Do not turn loader backhoe when differential lock is engaged. Loader backhoe differential may be damaged.

4. Turn steering wheel (1) gradually to right to turn right or gradually to left to turn left.



TA234762

DRIVING

1. Prepare for operation (page 2-60).
2. Start loader backhoe (page 2-61).
3. Warm up engine (page 2-66).
4. Install backhoe lockpins (page 2-123).
5. Raise loader bucket far enough for good ground clearance, however low enough for good visibility (page 2-83).

NOTE

If preparing vehicle for short or long distance moves, refer to pages 2-117 or 2-118.

6. Shift transmission into a range (page 2-68).
7. Shift speed gear assembly (reverser) into gear (page 2-71).
8. Shift transmission into gear (page 2-70).
9. If vehicle is to be driven on highway or open road, turn headlights on dim (page 2-78) for added safety.

NOTE

Depending on driving conditions, you may want to partially fill loader bucket (page 2-86), and backhoe bucket (page 2-96), with earth or debris for added stability.

10. Before putting vehicle in motion, carefully check traffic conditions, particularly, immediate front and rear of your vehicle, to insure no personnel or objects are in path of vehicle travel.

WARNING

Avoid coasting loader backhoe. Coasting reduces stability and drivability. Failure to observe this precaution could cause injury to personnel.

CAUTION

Avoid allowing engine to idle for long periods of time, this can cause excessive engine wear and eventually, failure.

11. See FM 21-305 for additional driving information.
12. When driving is complete shut down engine (page 2-67).

TOWING

NOTE

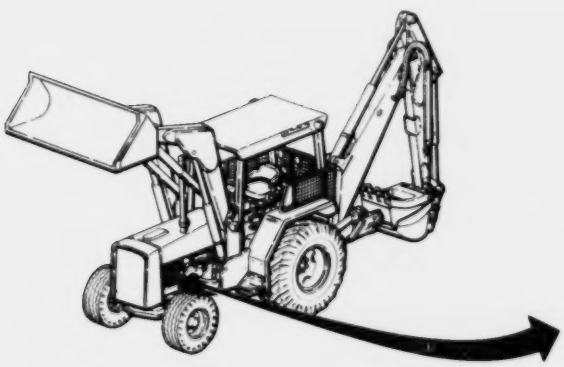
Loader backhoe can only be towed if loader bucket, backhoe bucket and stabilizers are off ground or can be raised off ground.

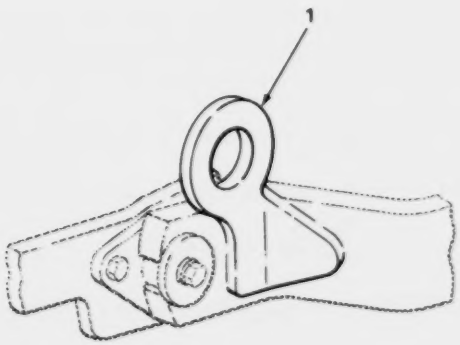
1. Raise loader bucket high enough for good visibility (page 2-83).
2. Raise backhoe bucket off the ground (page 2-92).
3. Install backhoe lockpins (page 2-123).
4. Raise both stabilizers (page 2-91).
5. Shift transmission gear shift lever to neutral (page 2-69).
6. Shift transmission range shift lever to neutral (page 2-68).
7. Shift speed gear assembly (reverser) control lever to neutral (page 2-71).
8. Attach sling from towing vehicle to front left and right lifting eye (1).
9. Disengage parking brake (2-73).

WARNING

Do not tow loader backhoe faster than 15 mph (24km/h). Loader backhoe may become difficult to steer and control. Failure to observe this warning could cause personal injury and damage to equipment.

10. Tow vehicle shortest possible distance.
11. Shut down engine (page 2-67).





TYPICAL BOTH SIDES

TA234817

CIGAR LIGHTER

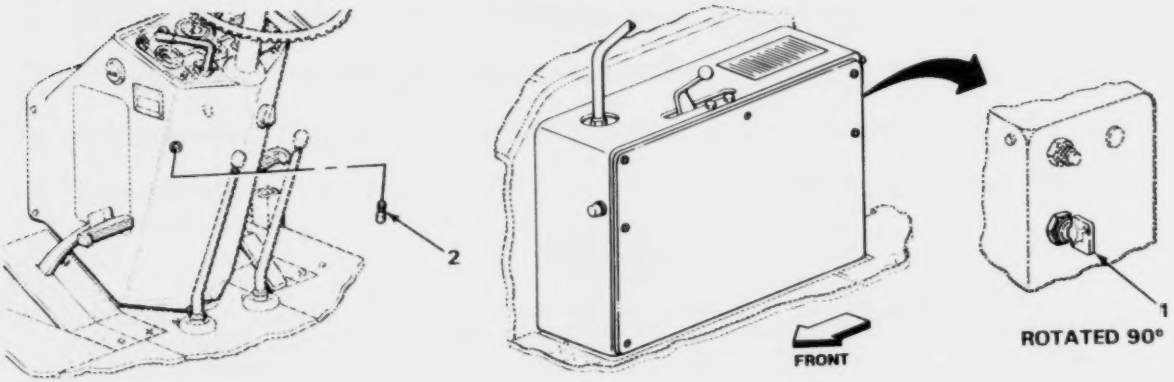
Use cigar lighter as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. Push in lighter element (2) and wait approximately 15 seconds until it releases.

WARNING

Avoid contact with inner coil of cigar lighter element. Coil is extremely hot. Failure to observe this precaution could cause serious burns.

3. Pull lighter element (2) out and light cigar or cigarette.
4. Push lighter element (2) in until outer retainer of lighter element seats.



SERVICE DRIVE FRONT AND COMBINATION TAILLIGHTS

Turn on low beam service drive front and combination taillights as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. Turn light switch (2) clockwise to fourth (H2) position. Service drive combination taillights (3) and front light (4) will come on low beam. Stop lamps will come on when brakes are applied.

Turn off low beam service drive front and combination taillight as follows:

1. Turn light switch (2) counterclockwise as far as it will go. All lights will go off.
2. Turn key counterclockwise and take out of ignition switch (1).

Turn on high beam service drive front and combination taillights as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. Turn light switch (2) clockwise to third (H1) position. Service drive combination taillights (3) and front light (4) will come on high beam. Stop lamps will come on when brakes are applied.

TA234818

SERVICE DRIVE FRONT AND COMBINATION TAILLIGHTS – CONTINUED

Turn off high beam service drive front and combination taillights as follows:

1. Turn light switch (2) counterclockwise as far as it will go. All lights will go off.
2. Turn key counterclockwise and take out of ignition switch (1).

FLOODLIGHTS

NOTE

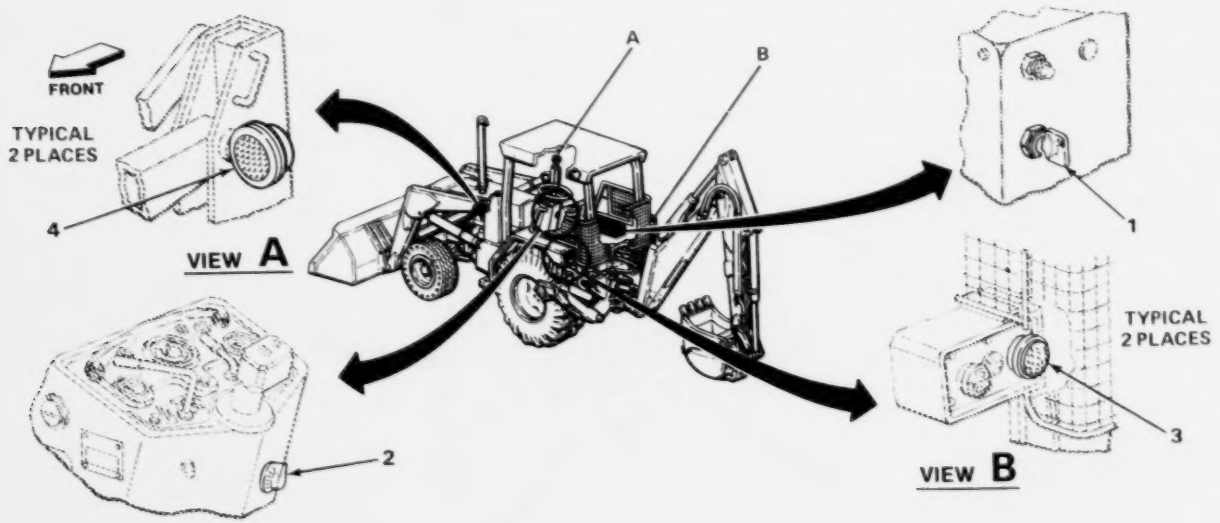
If only front floodlights are needed and not rear, turn service front lights on high beam (page 2-78).

Floodlights are used to light up worksite in front of and behind loader backhoe during night operations. Turn on floodlights as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. Turn light switch (2) clockwise to second (F) position. Front and rear floodlights (4) and (3) will come on.

Turn off floodlights as follows:

1. Turn light switch (2) counterclockwise as far as it will go. All lights will go off.
2. Turn key counterclockwise and take out of ignition switch (1).



TA234819

EMERGENCY FLASHERS

Emergency flashers are used to notify other vehicles of any type of road situation or emergency. Turn on emergency flashers as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. Push in two side buttons (2) and (3) of turn signal control and emergency flasher control unit (4) simultaneously. Both side emergency flashers and turn signals (5) and rear floodlights (6) will flash.

Turn off emergency flashers as follows:

1. Press top button (7) of turn signal control and emergency flasher control unit (4) to release side buttons (2) and (3).
2. Turn key counterclockwise and take out of ignition switch (1).

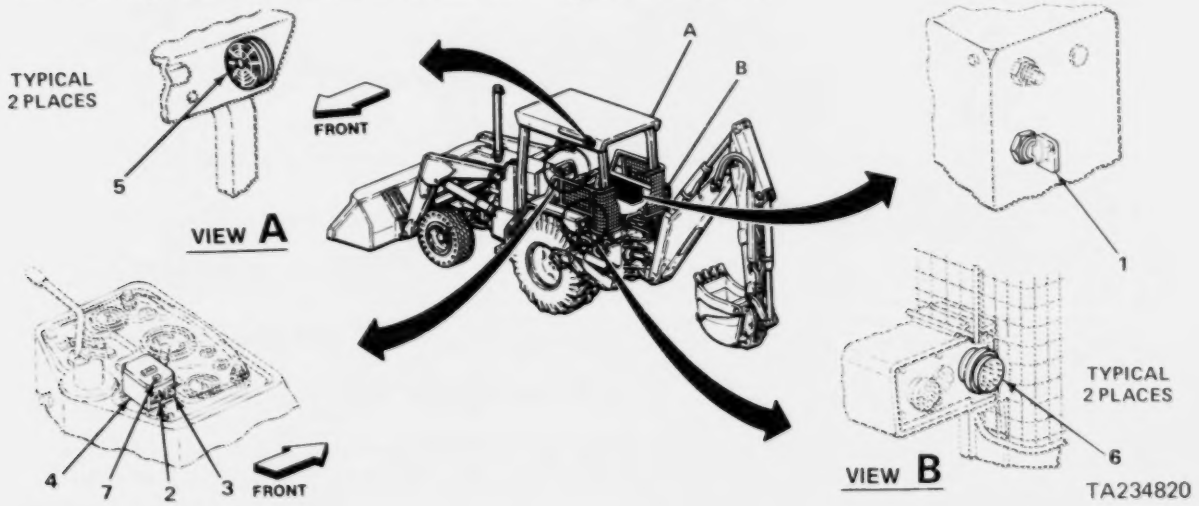
TURN SIGNALS

Turn signals are used to notify other vehicles when and what direction you are turning. Turn on turn signals as follows:

1. Place key in ignition switch (1) and turn clockwise.
2. When turning right, push in lower side button (2). When turning left, push in upper side button (3). Appropriate emergency flasher and turn signal (5) and rear floodlights (6) will flash.

Turn off turn signals as follows:

1. Press top button (7) of turn signal control and emergency flasher control unit (4) to release side buttons (2) and (3).
2. Turn key counterclockwise and take out of ignition switch (1).



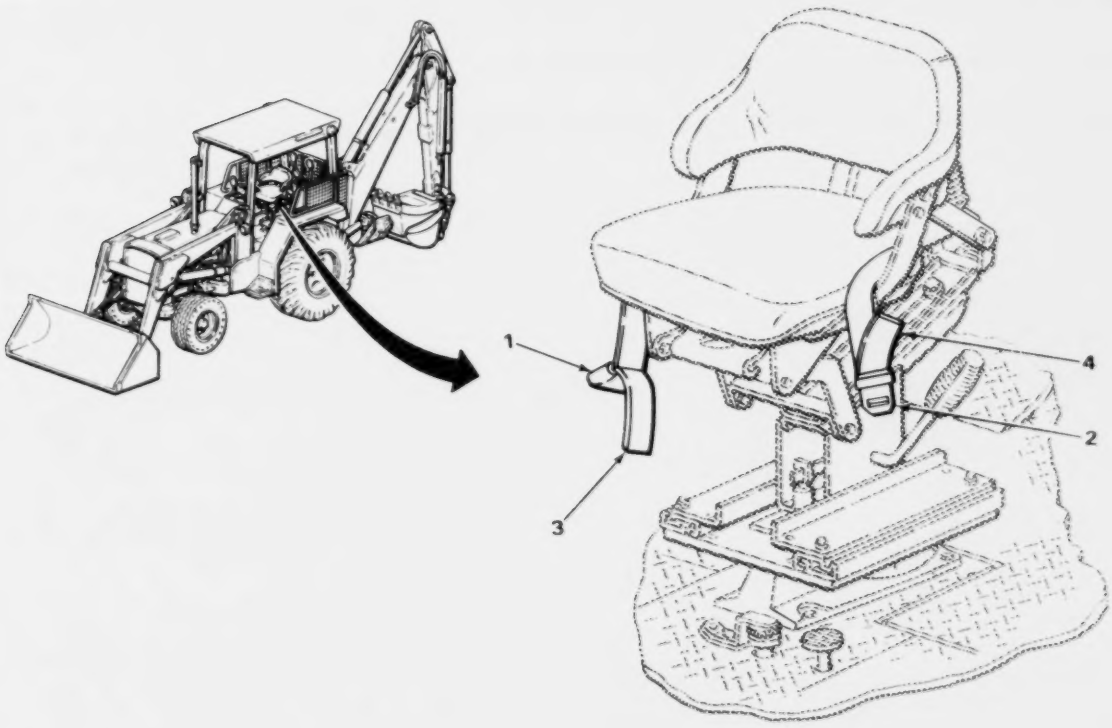
SEAT BELT

Seat belt is used to strap operator in seat when operating a vehicle with rollover protective structure. Buckle seat belt as follows:

1. If seat belt needs to be loosened, pull out on buckle halves (1) and (2) until straps (3) and (4) slide through buckle halves (1) and (2).
2. Once seated, push buckle halves (1) and (2) together until locked.
3. Pull on straps (3) and (4) until seat belt fits snugly around waist.

Unbuckle seat belt as follows:

Pull up end of buckle half (1) and separate halves (1) and (2).



TA234821

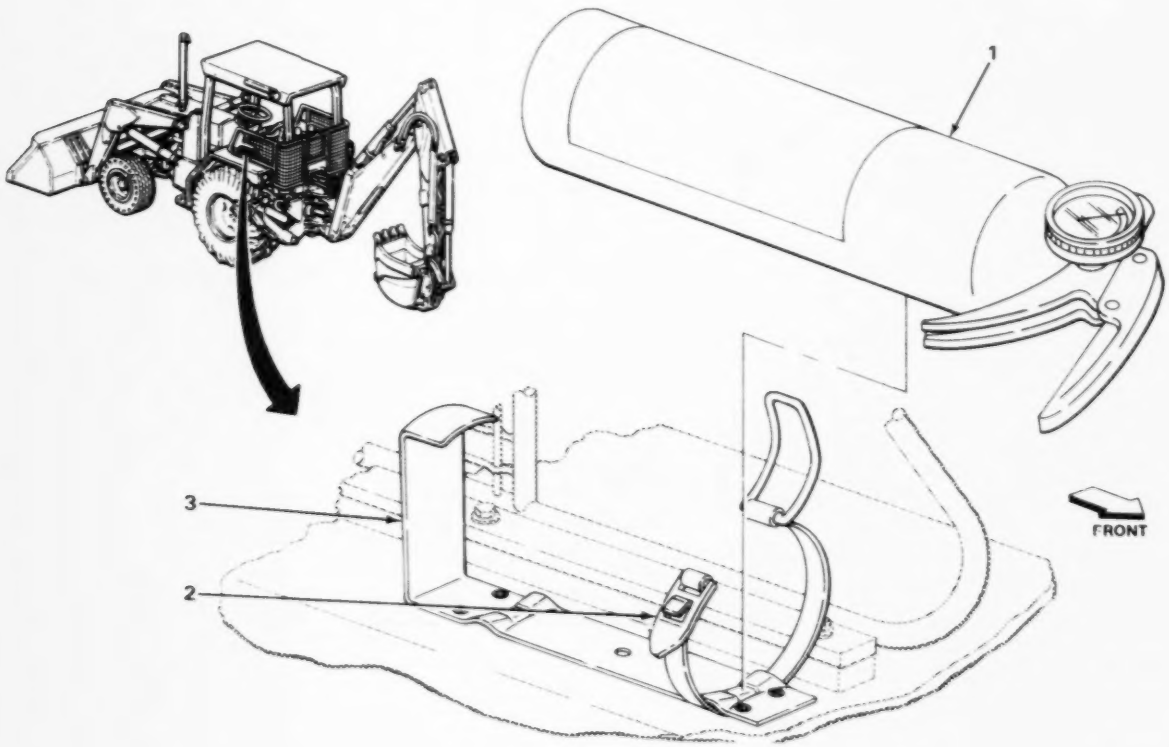
FIRE EXTINGUISHER

WARNING

Do not test fire extinguisher. Partial discharge could make a fire extinguisher useless in an emergency. Replace a discharged fire extinguisher as soon as possible.

Dry chemical type fire extinguisher (1) provided for emergency use is located in cab, left of operator's seat. Operate fire extinguisher (1) as follows:

1. Unlatch clamp (2).
2. Lift fire extinguisher (1) out of bracket (3).
3. Remove any safety seals and trigger latching devices from fire extinguisher (1).
4. Hold fire extinguisher (1) upright, and point discharge nozzle toward base of flame.
5. Using side to side sweeping motion, discharge contents of fire extinguisher (1) to put out fire. Replace discharged fire extinguisher (1).
6. Place fully charged fire extinguisher (1) in bracket (3).
7. Latch clamp (2) to secure fully charged fire extinguisher (1) in place.



TA234822

LOADER BUCKET RAISING, LOWERING, DUMPING, AND RETRACTING

To operate loader bucket, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

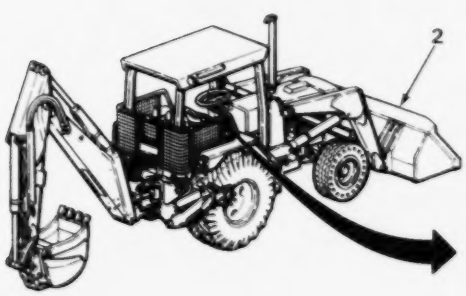
When loader bucket lift cylinders have reached their stroke limits, allow loader backhoe control lever to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

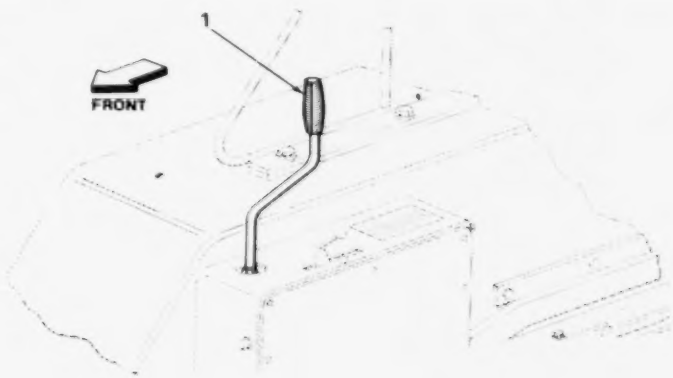
1. Prepare for operation (page 2-60).
2. Start engine (page 2-61).
3. Warm up engine (page 2-66).

NOTE

Bucket and lift arms travel speed can be controlled by pressure applied to loader bucket control lever.

4. Pull loader bucket control lever (1) back to raise loader bucket (2).
5. Push loader bucket control lever (1) forward to lower loader bucket (2).
6. Push loader bucket control lever (1) right (away from you) to dump bucket (2).
7. Pull loader bucket control lever (1) left (toward you) to retract bucket (2).





TA234823

LOADER BUCKET RAISING, LOWERING, DUMPING, AND RETRACTING – CONTINUED

NOTE

If loader bucket control lever is released during operation, it will return to neutral position and the bucket and loader lift arms will be held in position.

Once operator has become more familiar with operation of the loader bucket, he can reduce cycle time by using operation procedure in steps 8 thru 11.

8. Move loader bucket control lever (1) to right forward position to lower and dump bucket (2) simultaneously.

9. Move loader bucket control lever (1) to left forward position to lower and retract bucket (2) simultaneously.

10. Move loader bucket control lever (1) to right rear position to raise and dump bucket (2) simultaneously.

11. Move loader bucket control lever (1) to left rear position to raise and retract bucket (2) simultaneously.

NOTE

Loader bucket float position will only be used when loader backhoe is moved backward. If you are not familiar with loader bucket float position on loader bucket control lever, do steps 12 thru 14.

12. Shut down engine (page 2-67).

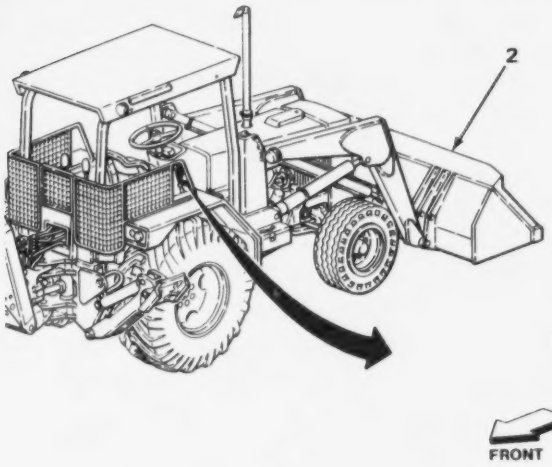
13. Move bucket control lever (1) forward beyond lowering position until lever (1) locks forward in float position. Pull back to neutral position. Repeat several times until you can move smoothly in and out of float position.

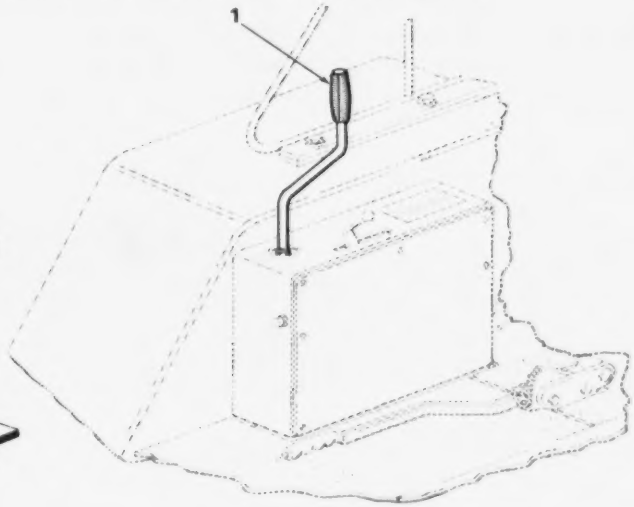
14. Start engine (page 2-61).

15. Move loader bucket control lever (1) all the way forward for bucket float position. In this position, bucket (2) will move up and down freely while riding on ground. Lever (1) will stay in that position until you return to neutral position.

16. When operating control lever (1) in bucket float position, make sure control lever movements are quick. Moving control lever slowly in and out of float position can cause bucket to be lowered more than desired.

LOADER BUCKET RAISING, LOWERING, DUMPING, AND RETRACTING – CONTINUED



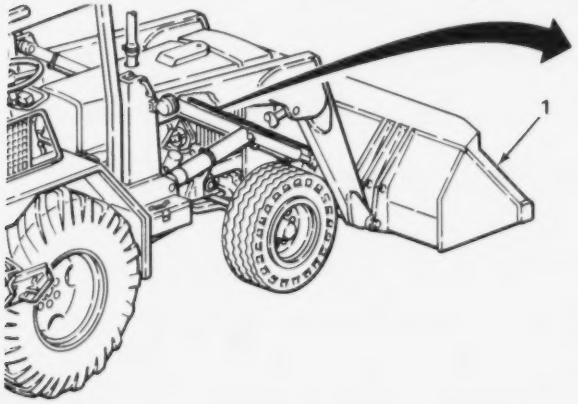


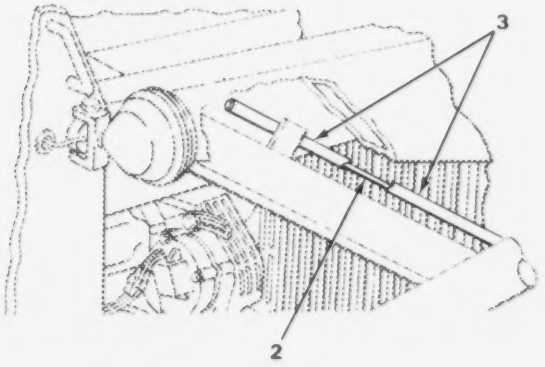
LOADER BUCKET LEVEL INDICATOR

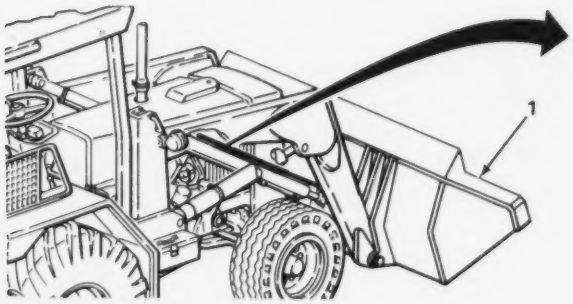
Bucket level indicator will show angle of bucket or when it is parallel with ground.

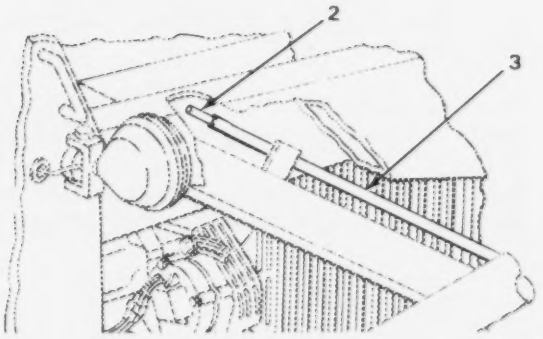
1. When loader bucket (1) is parallel to ground, rod (2) will be flush with end of tube (3).

2. When loader bucket (1) is angled upward from ground, rod (2) will extend beyond tube (3). Farther rod (2) extends beyond tube (3), greater the angle.





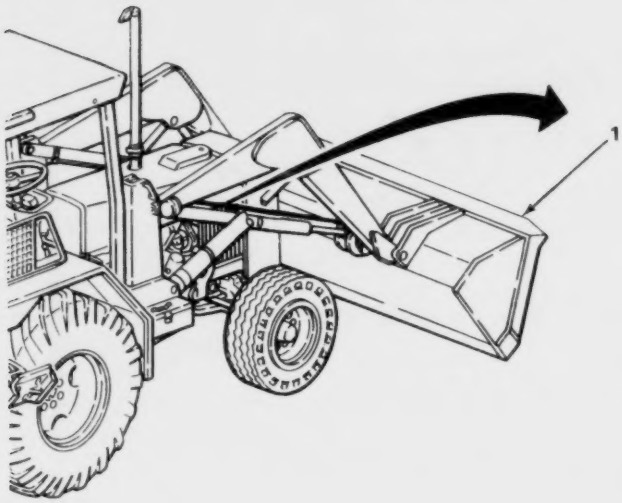


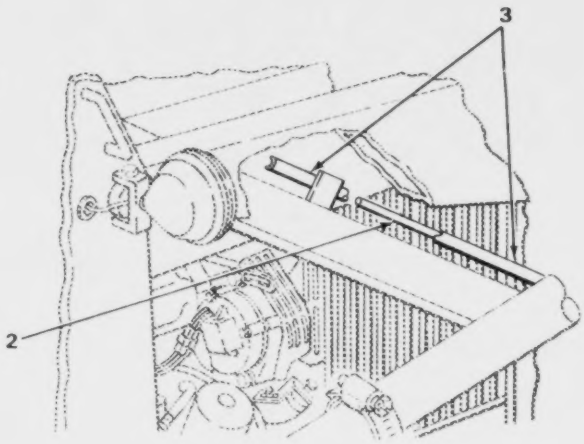


TA234824

LOADER BUCKET LEVEL INDICATOR – CONTINUED

3. When loader bucket (1) is angled downward from ground, rod (2) will retract into tube (3). Farther rod (2) retracts into tube (3), greater the angle.





LOADER BUCKET LOADING

To load a pile of material into another vehicle, do the following:

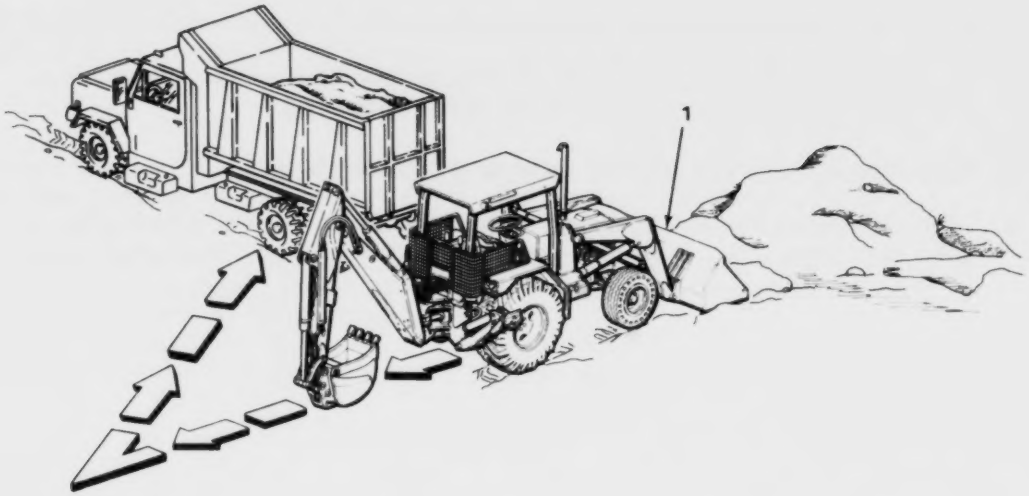
NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Park vehicle to be loaded as near material as possible.
2. Keep loader backhoe at approximately right angle to pile of material and vehicle being loaded.
3. Fill lowered bucket (1) by moving forward into center of pile. Try to keep working area smooth.
4. Raise full bucket (1) while backing away from material to be loaded and moving forward toward vehicle being loaded (use "v" pattern to keep turns to a minimum).
5. Dump load into vehicle box. Shake bucket (1), by jolting it up and down, only when necessary to loosen materials stuck in bottom.

TA234825

LOADER BUCKET LOADING – CONTINUED



LOADER BUCKET DIGGING

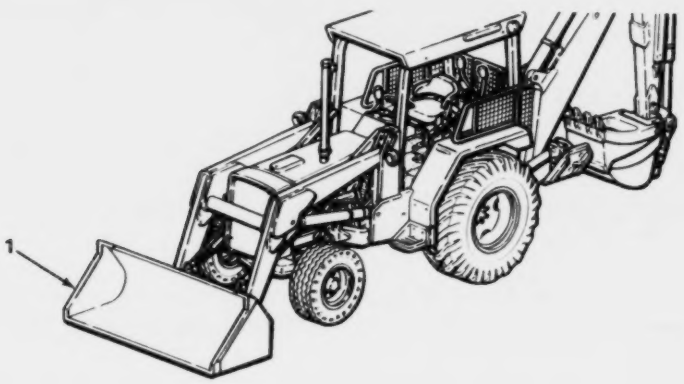
When using loader backhoe bucket for digging and excavating, do the following:

NOTE

When using loader bucket for digging, bucket will only dig approximately 4 inches (10.2 cm) below surface.

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

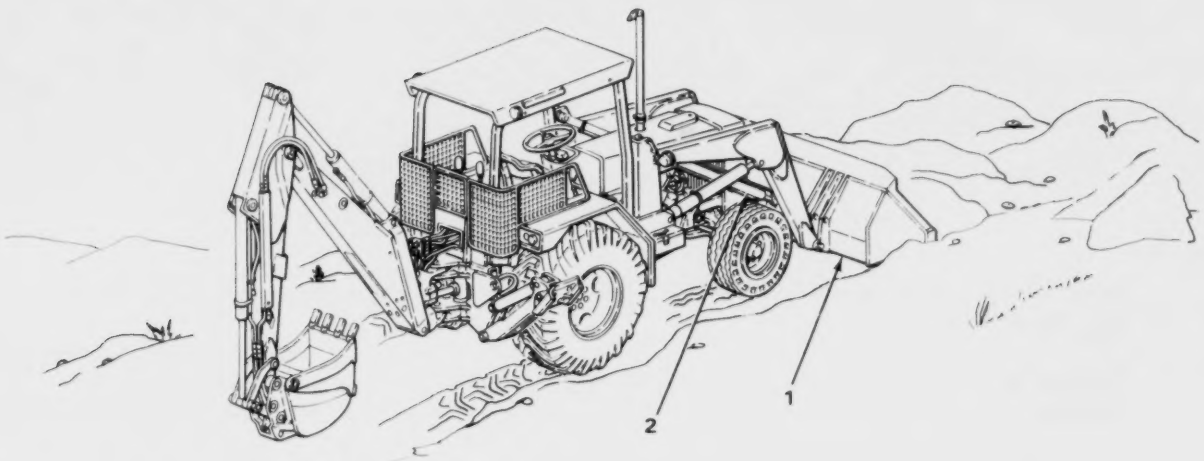
1. Lower bucket (1) to desired depth and move loader backhoe forward.
2. Do not raise bucket (1) any higher than necessary to fill.



TA234826

LOADER BUCKET DIGGING – CONTINUED

3. Move loader backhoe to dump area and dump bucket (1).
4. On hard ground, use bucket cylinders (2) to angle bucket in and out of ground, rather than using only forward movement of loader backhoe.
5. When starting to excavate, use as flat a ramp as possible.
6. Try to do most of the work by driving loader backhoe forward out of excavation site rather than backing out. A steeper ramp can then be used.



LOADER BUCKET GRADING AND LEVELING

To grade and level with loader bucket, do the following:

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

Grading is filling low spots and cutting high spots, on ground with slope or incline to give ground a smooth surface. Leveling is for same purpose but done on level ground.

1. When starting grading cut, move gear shift lever (1) to position that will allow you to complete cut without further shifting.

TA234827

LOADER BUCKET GRADING AND LEVELING – CONTINUED

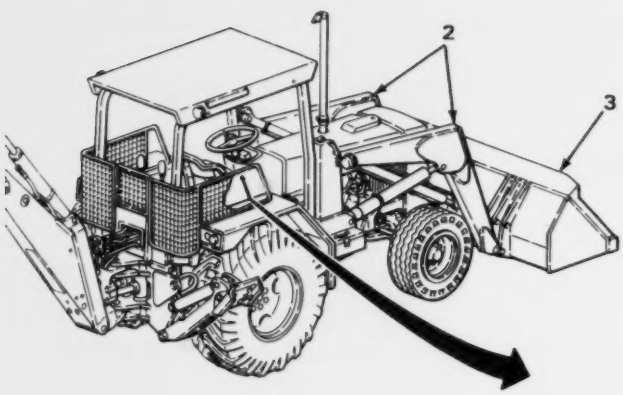
2. With loader lift arms (2) lowered and loader bucket (3) level, cut high spots, then spread dirt evenly in low spots by letting dirt spill from partially opened bucket.

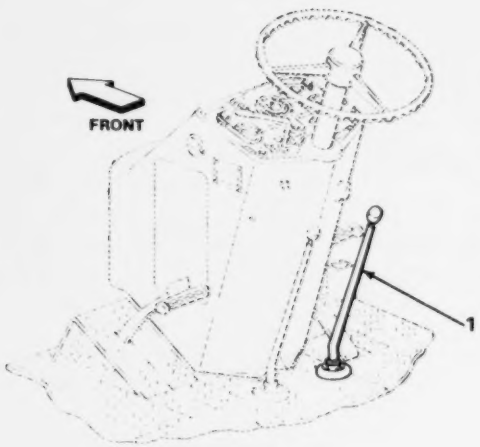
NOTE

When leveling ground by dragging bucket with vehicle in reverse, do not put loader bucket in float position. This is to be done only when finishing the surface.

3. Once ground is nearly level, lower loader lift arms (2) and tilt bucket (3) forward (front bottom bucket edge can be used as leveler) and operate vehicle in reverse, dragging loader bucket (3) to level ground.

4. Once leveling is completed, go to loader bucket finishing (see below).





LOADER BUCKET FINISHING

To finish surface with loader backhoe, do the following:

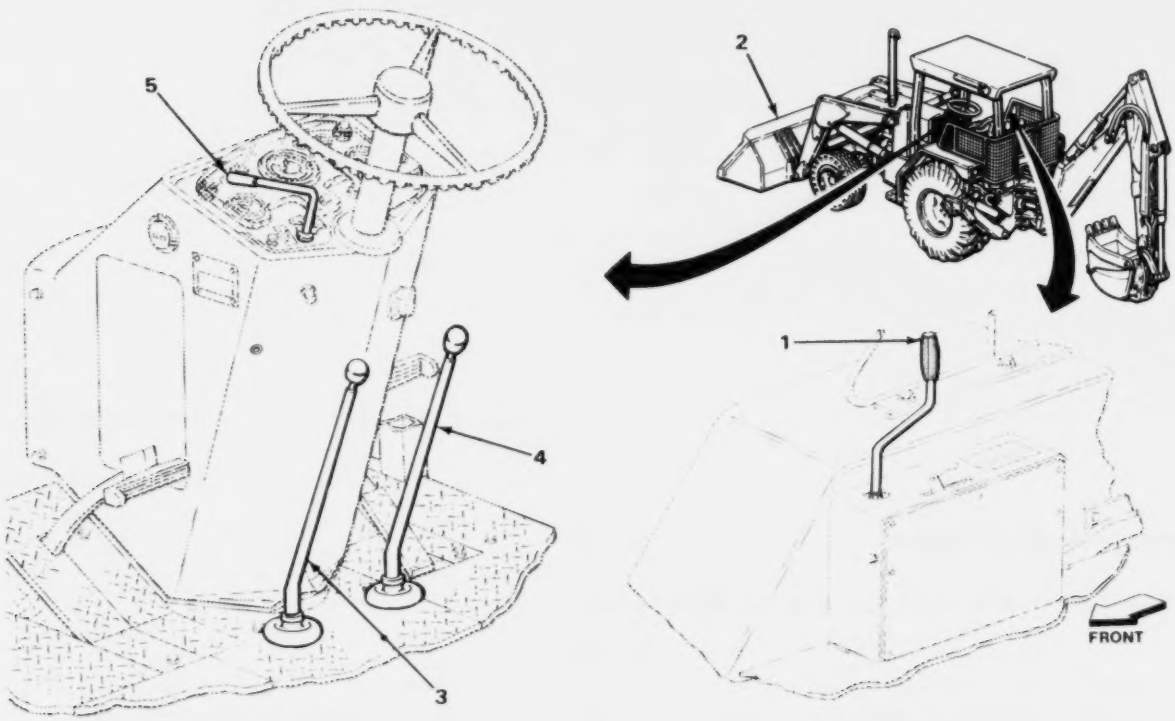
NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

TA234828

LOADER BUCKET FINISHING – CONTINUED

1. Push loader backhoe bucket control lever (1) forward to lower loader bucket (2) to the ground.
2. Push loader bucket control lever (1) to float position (page 2-83).
3. Move range shift lever (3) and gear shift lever (4) to desired position and move speed gear assembly (reverser) control lever (5) into reverse.
4. To smooth work area surface, drive loader backhoe in reverse and drag loader bucket (2), in float position (page 2-83), across surface.
5. Pull back loader bucket control lever (1) to raise loader bucket (2) enough to clear ground.
6. Move speed gear assembly (reverser) control lever (5) to forward position.
7. Drive loader backhoe forward to starting location.
8. Repeat steps 1 thru 7 until surface is finished.



TA234829

BACKHOE STABILIZER LOWERING AND RAISING

WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

CAUTION

When stabilizer lift cylinders have reached their stroke limits, either raised or lowered, allow stabilizer control lever to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

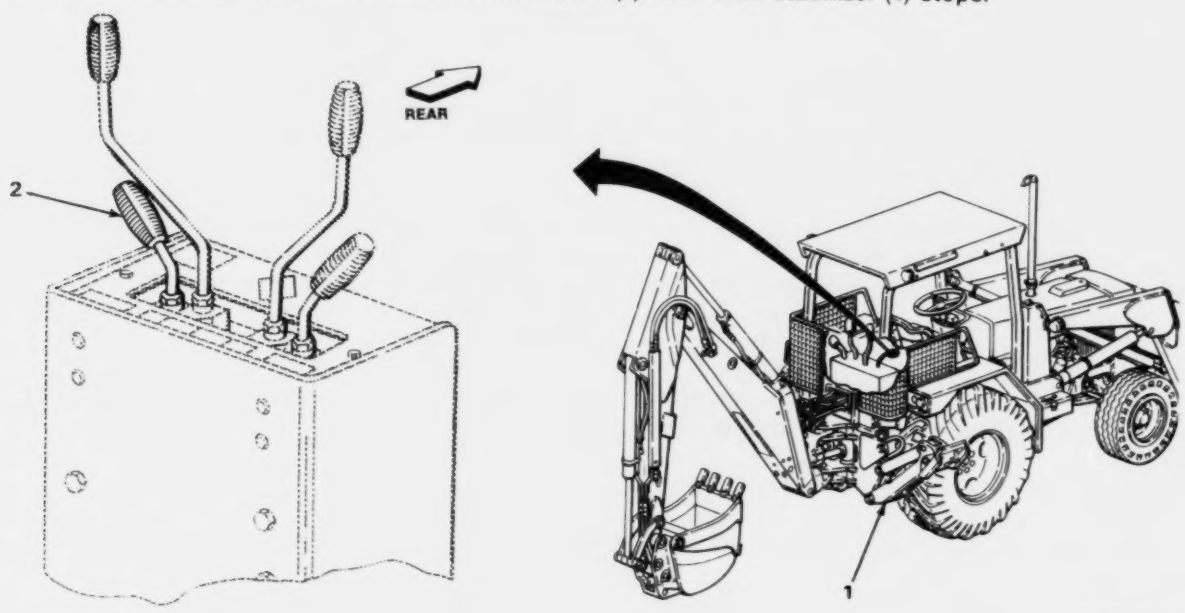
There are two stabilizers on this vehicle. They are the same. Right side is shown. Stabilizers may be raised or lowered one at a time, or together.

1. To lower stabilizer (1), push stabilizer control lever (2) forward until stabilizer lifts vehicle so that rear tire just touches ground.

WARNING

Be careful when raising stabilizers. Remember that stabilizers may be the only support preventing loader backhoe from rolling into excavation. If loader backhoe rolls over, serious injury or death to personnel can result.

2. To raise stabilizer (1), pull stabilizer control lever (2) back until stabilizer (1) stops.



TA234830

BACKHOE OPERATION

To operate backhoe boom, bucket, and dipperstick, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control lever to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Prepare for operation (page 2-60).
2. Start engine (page 2-61).
3. Warm up engine (page 2-66).
4. Set hand throttle to run engine at 1500 to 2200 rpm for normal backhoe operation.
5. Move seat back for backhoe operation (page 3-65).
6. Make sure backhoe lockpins are removed (page 2-123).

WARNING

Do not operate backhoe with the speed gear assembly (reverser) control lever in the reverse position. If gearshift lever is accidentally bumped, loader backhoe can accelerate quickly causing operator to lose control. Failure to observe this precaution can cause serious injury to personnel.

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

Boom and dipperstick travel speed can be controlled by pressure applied to boom control lever and dipperstick control lever.

7. Lower backhoe stabilizers (page 2-91).
8. Pull backhoe boom control lever (1) back toward you, to raise boom (2).
9. Push backhoe boom control lever (1) forward away from you, to lower boom (2).

BACKHOE OPERATION – CONTINUED

NOTE

When boom is at its fastest travel, swing brake automatically slows boom before it reaches stops on main frame.

10. Move backhoe boom control lever (1) to left to move boom (2) left.

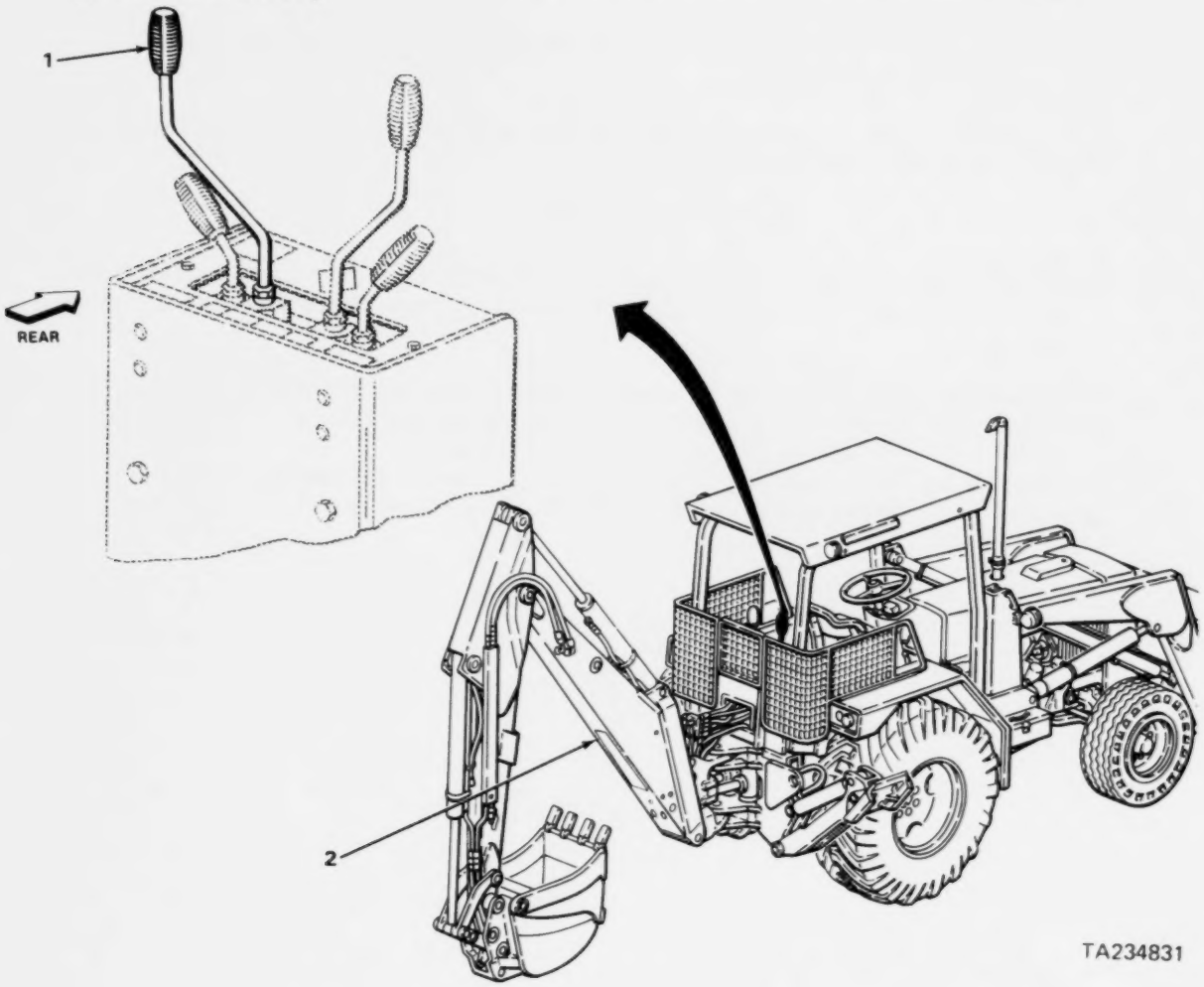
11. Move backhoe boom control lever (1) to right to move boom (2) right.

NOTE

If backhoe boom control lever is released during operation, it will return to neutral position and boom, dipperstick, or bucket will be held in position.

When operator has become more familiar with operation of loader backhoe boom, he can reduce cycle time by using operation procedures in steps 12 thru 15.

12. Push backhoe boom control lever (1) to forward left position to lower and swing boom (2) left simultaneously.



BACKHOE OPERATION – CONTINUED

13. Push backhoe boom control lever (1) to forward right position to lower and swing boom (2) right simultaneously.

14. Pull backhoe boom control lever (1) to back left position to raise and swing boom (2) left simultaneously.

15. Pull backhoe boom control lever (1) to back right position to raise and swing boom (2) right simultaneously.

NOTE

If backhoe boom and dipperstick control lever is released during operation, it will return to neutral position and dipperstick and boom will be held in position.

16. Pull backhoe bucket and dipperstick control lever (3) back towards you to move bucket (4) and dipperstick (5) in towards vehicle.

17. Push backhoe bucket and dipperstick control lever (3) forward, away from you, to move bucket (4) and dipperstick (5) out away from vehicle.

18. Move backhoe bucket and dipperstick control lever (3) to your left to dig with bucket (4) (bucket scoops toward vehicle).

19. Move backhoe bucket and dipperstick control lever (3) to your right to dump the bucket (4) (bucket swings away from vehicle).

NOTE

When operator has become more familiar with operation of backhoe bucket and dipperstick, he can reduce cycle time by using operation procedures in steps 20 thru 24.

20. Pull backhoe bucket and dipperstick control lever (3) to back left position to move dipperstick (5) in toward vehicle and dig with bucket (4) simultaneously.

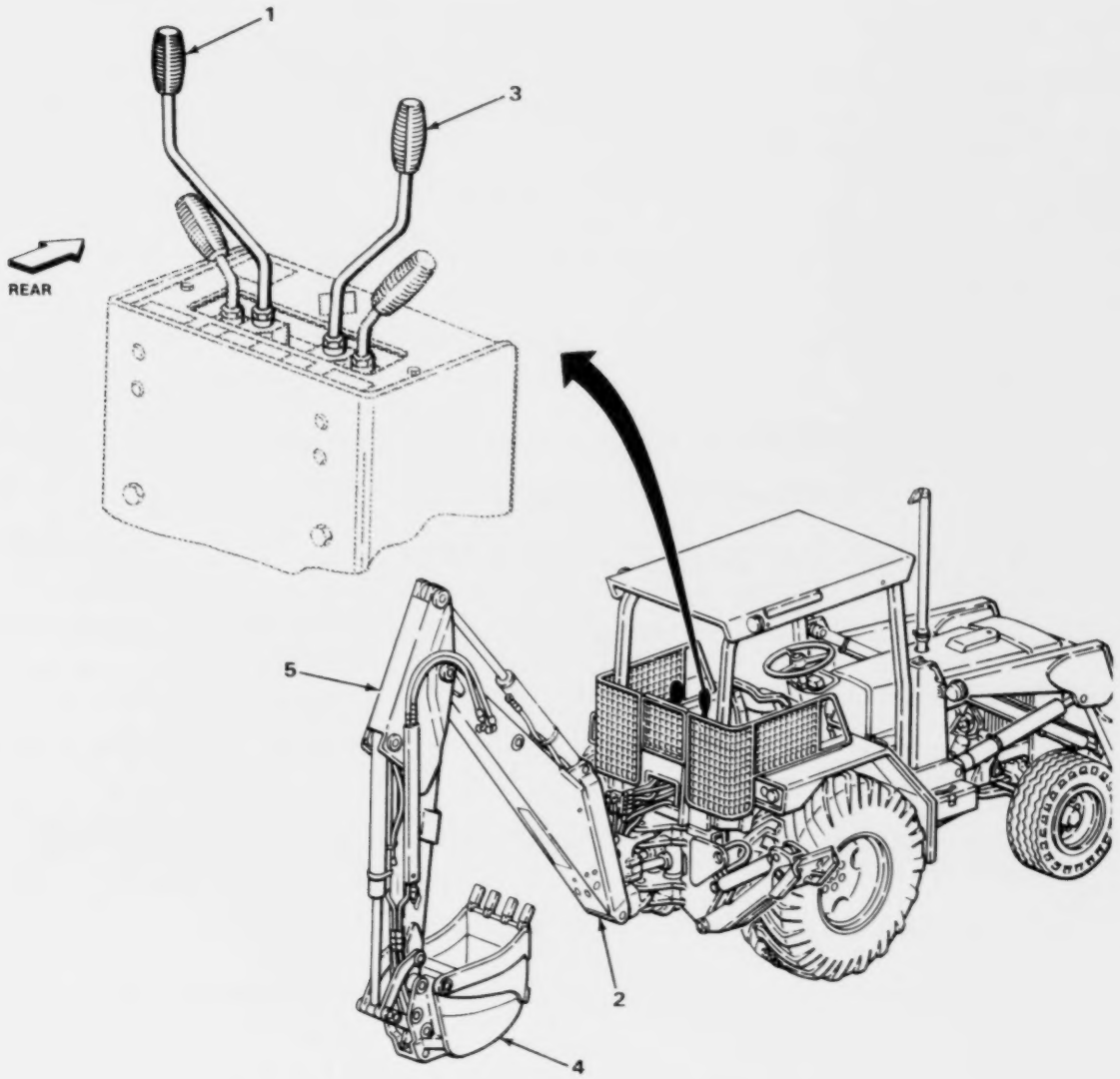
21. Pull backhoe bucket and dipperstick control lever (3) to back right position to move dipperstick (5) in toward vehicle and dump bucket (4) simultaneously.

BACKHOE OPERATION – CONTINUED

22. Push backhoe bucket and dipperstick control lever (3) to forward left position to move dipperstick (5) out away from vehicle and dig with bucket (4) simultaneously.

23. Push backhoe bucket and dipperstick control lever (3) to forward right position to move dipperstick (5) out away from vehicle and dump bucket (4) simultaneously.

24. Operate backhoe boom control lever (1) and bucket and dipperstick control lever (3) simultaneously for fastest cycle time.



TA234832

BACKHOE BUCKET DIGGING

When digging with backhoe using bucket digging method, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

CAUTION

When backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

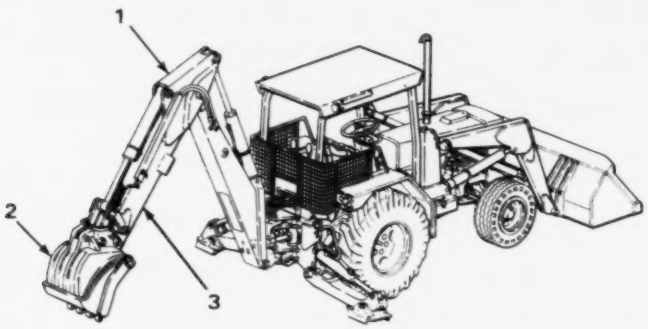
For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

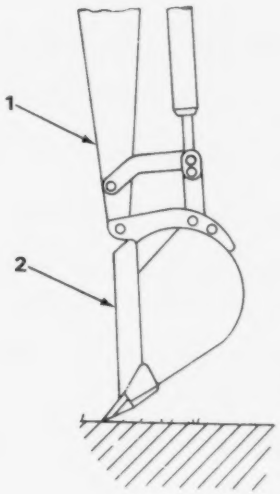
1. Lower backhoe stabilizers (page 2-91).
2. If not already removed, remove backhoe lockpins (page 2-123).
3. Move dipperstick (1) to vertical position from ground with open face of bucket (2) parallel with dipperstick (1).
4. Move dipperstick (1) away from loader backhoe 2 feet (610 mm) more from vertical position.
5. Use pressure on boom (3) to force bucket (2) into ground.
6. When bucket (2) is in ground, retract dipperstick (1) and roll bucket (2) toward you at same time until bucket (2) is full.
7. If bucket (2) stalls, raise boom (3) slightly and continue dipperstick (1) and bucket (2) retraction until bucket (2) is full.
8. Raise bucket (2) to top of trench. Dump it on spoil pile.

BACKHOE BUCKET DIGGING – CONTINUED

9. When loading trucks with high sides, continue retracting bucket (2) as it is being raised to prevent spilling.

10. Repeat steps 3 thru 9, lowering boom (3) 4 to 6 inches (102 to 152 mm) on each succeeding pass until digging is completed.





BACKHOE CROWD DIGGING

When digging with backhoe using the crowd digging method, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

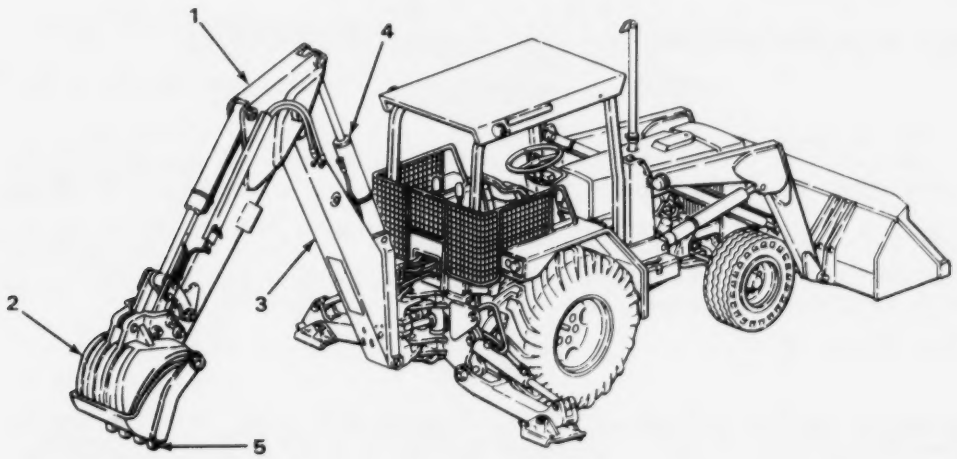
For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

1. Lower backhoe stabilizers (page 2-91).

TA234833

BACKHOE CROWD DIGGING – CONTINUED

2. If not already removed, remove backhoe lockpins (page 2-123).
3. Move dipperstick (1) to vertical position from ground with open face of bucket (2) in vertical position.
4. Move dipperstick (1) away from loader backhoe 2 feet (610 mm) more from vertical position.
5. Use pressure on boom (3) to force bucket (2) into ground.
6. Using only crowd cylinder (4), roll bucket (2) toward you until teeth (5) are flat on ground.
7. Retract dipperstick (1) until bucket (2) is half full.
8. Roll bucket (2) toward you while retracting dipperstick (1) until bucket (2) is full.
9. Raise bucket (2) to top of trench. Dump it on spoil pile. When operating on a hillside, dump spoil dirt on uphill side of trench.
10. When loading truck with high sides, continue retracting bucket (2) as it is being raised to prevent spilling.
11. Repeat steps 3 thru 9, lowering boom (3) each succeeding pass until digging is completed.



LIFTING LOAD WITH BACKHOE

To lift maximum load with backhoe, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

rA234834

LIFTING LOAD WITH BACKHOE – CONTINUED

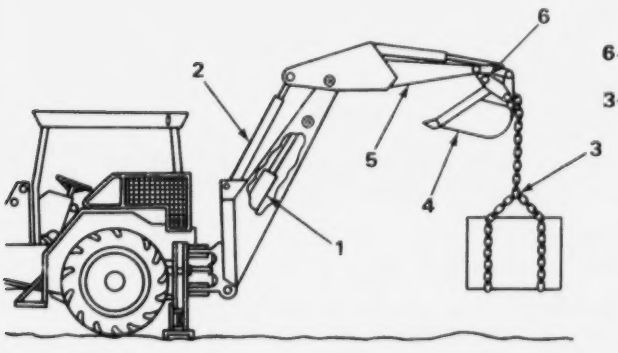
CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

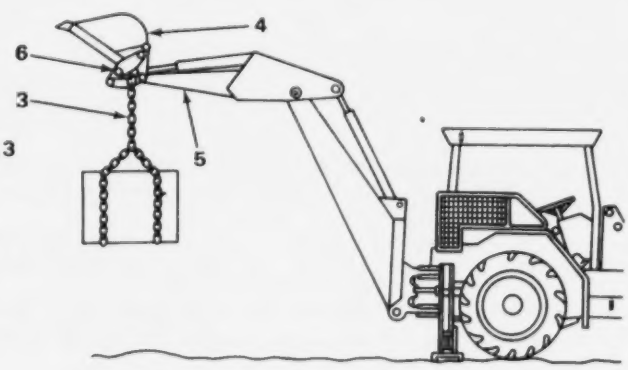
NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Lower loader bucket (page 2-83).
2. Move seat back for backhoe operation (page 3-65).
3. Lower backhoe stabilizers (page 2-91).
4. If not already removed, remove backhoe lockpins (page 2-123).
5. Extend boom cylinder (1) and crowd cylinder (2) until lifting chain (3) can be fastened.
6. For Serial Numbers 319995 thru 342573, fasten chain (3) over back of bucket (4) to dipperstick (5), 2 inches (51 mm) from bucket pin (6). Be sure all chains (3) are fastened tightly.
7. For Serial Numbers 235786 thru 235999, rotate bucket (4) away from vehicle and fasten chain (3) across open face of bucket (4) to dipperstick (5) 2-inches (51 mm) from bucket pin (6). Be sure that all chains (3) are fastened tightly.
8. Without lifting load, retract boom cylinder (1) and raise to full height. It may be necessary to extend crowd cylinder (2).
9. To lift load, retract crowd cylinder (2).



SERIAL NUMBERS 319995 THRU 342573



SERIAL NUMBERS 235786 THRU 235999

TA234835

BACKHOE BUCKET POSITIONS

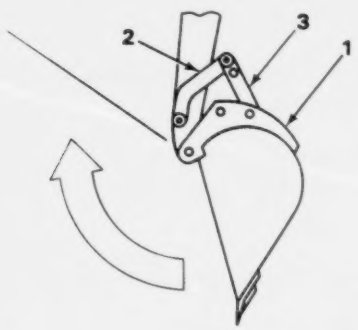
NOTE

To change bucket positions for different digging applications, notify Organizational Maintenance.

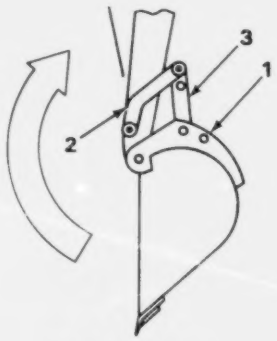
1. To position bucket (1) for power digging, guide link (2) should be attached to first hole on coupler link (3). Coupler link (3) should be attached to bottom hole on back of bucket (1). Power digging position is used for digging in hard ground when maximum bucket power is needed.

2. To position bucket (1) for truck loading, guide link (2) should be attached to first hole on coupler link (3). Coupler link (3) should be attached to top hole on back of bucket (1). Truck loading position is used for loading trucks with high sides. This position allows bucket (1) to retract to it's maximum angle. Do not use hydraulic impactor with bucket in this position.

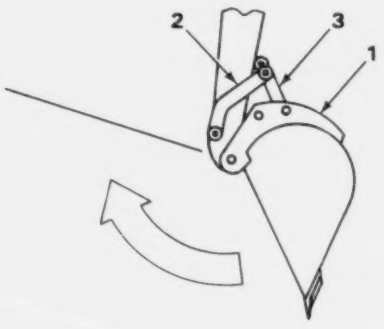
3. To position bucket (1) for vertical wall digging, guide link (2) should be attached to second hole on coupler link (3). Coupler link (3) should be attached to bottom hole on back of bucket (1). Vertical wall position is used when vertical walls are required when digging. This position allows bucket (1) to open to its maximum angle.



POWER DIGGING



TRUCK LOADING



VERTICAL WALL

HYDRAULIC EARTH AUGER ATTACHMENT INSTALLATION

To install earth auger to backhoe, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

TA234913

HYDRAULIC EARTH AUGER ATTACHMENT INSTALLATION – CONTINUED

1. Fill loader bucket (1) with material to add extra weight and stability to front end (page 2-86).
2. Position loader backhoe so that auger (2) is close enough to backhoe dipperstick (3) for attachment.
3. Lower loader bucket (page 2-83).

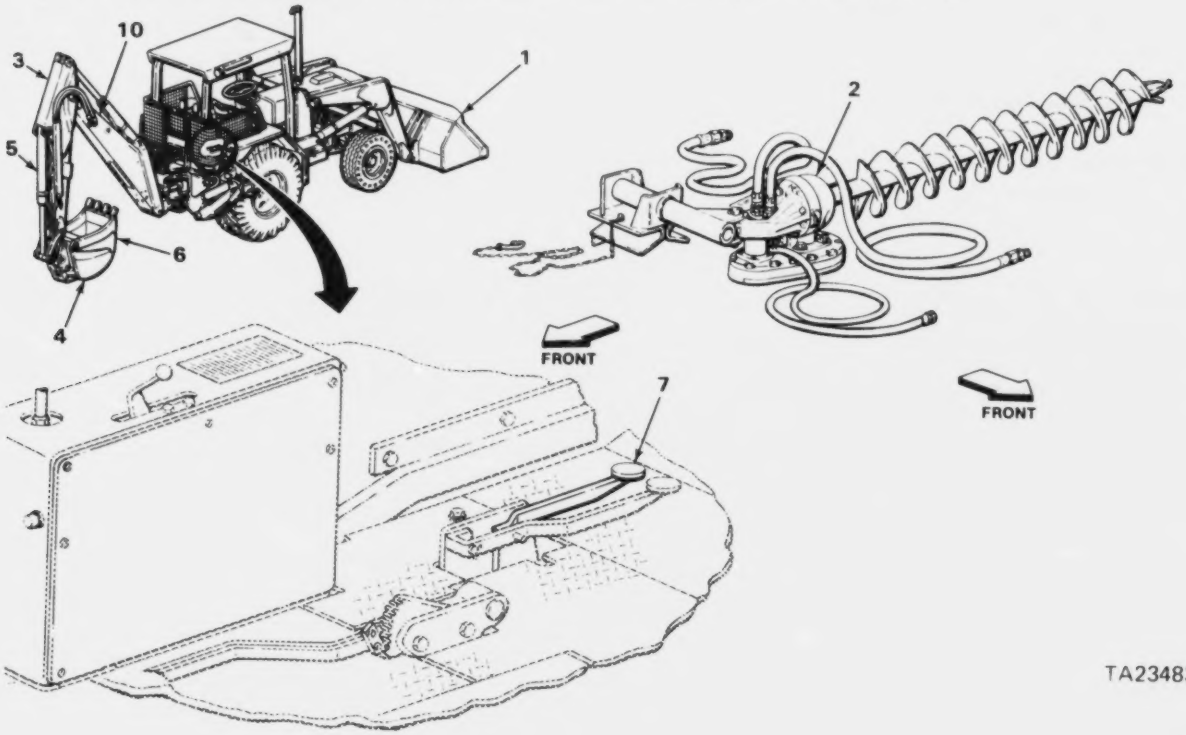
WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

For more information on how to operate backhoe controls, see Backhoe Operation (page 2-92).

4. Lower backhoe stabilizers (page 2-91).
5. If not already removed, remove backhoe lockpins (page 2-123).
6. Rotate bucket (4) so that bucket cylinder (5) is fully extended.
7. Extend dipperstick (3) out to full reach.
8. Open backhoe bucket jaw (6) by pressing down on short jaw bucket pedal (7).



TA234836

HYDRAULIC EARTH AUGER ATTACHMENT INSTALLATION – CONTINUED

NOTE

Auger hitch can be attached so that auger can be used on either side of backhoe bucket.

9. Make sure auger chain housing (1) is facing away from bucket (2).

10. Lower bucket (2) onto auger hitch (3) by lowering boom (4). close jaw (5) by pressing down on long jaw bucket pedal (6).

WARNING

When operating earth auger and connecting and disconnecting auger hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

11. Attach safety chain (7) over leading edge of bucket (2).

12. Shut down engine (page 2-67).

WARNING

When operating earth auger and connecting and disconnecting auger hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

13. Relieve hydraulic system pressure by raising loader bucket (8) until it will not raise any farther, then lower bucket (8) to ground.

14. Disconnect bucket cylinder hoses (9) with quick disconnect couplings (10) on dipper-stick (11).

15. Pull up on bottom part of couplings (12) and pull plugs (13) out of couplings (12).

16. Make sure all hydraulic couplings are clean and free of dirt before making connections. Connect two main auger hydraulic hoses (14) to couplings (10) on bucket cylinder hoses (9).

CAUTION

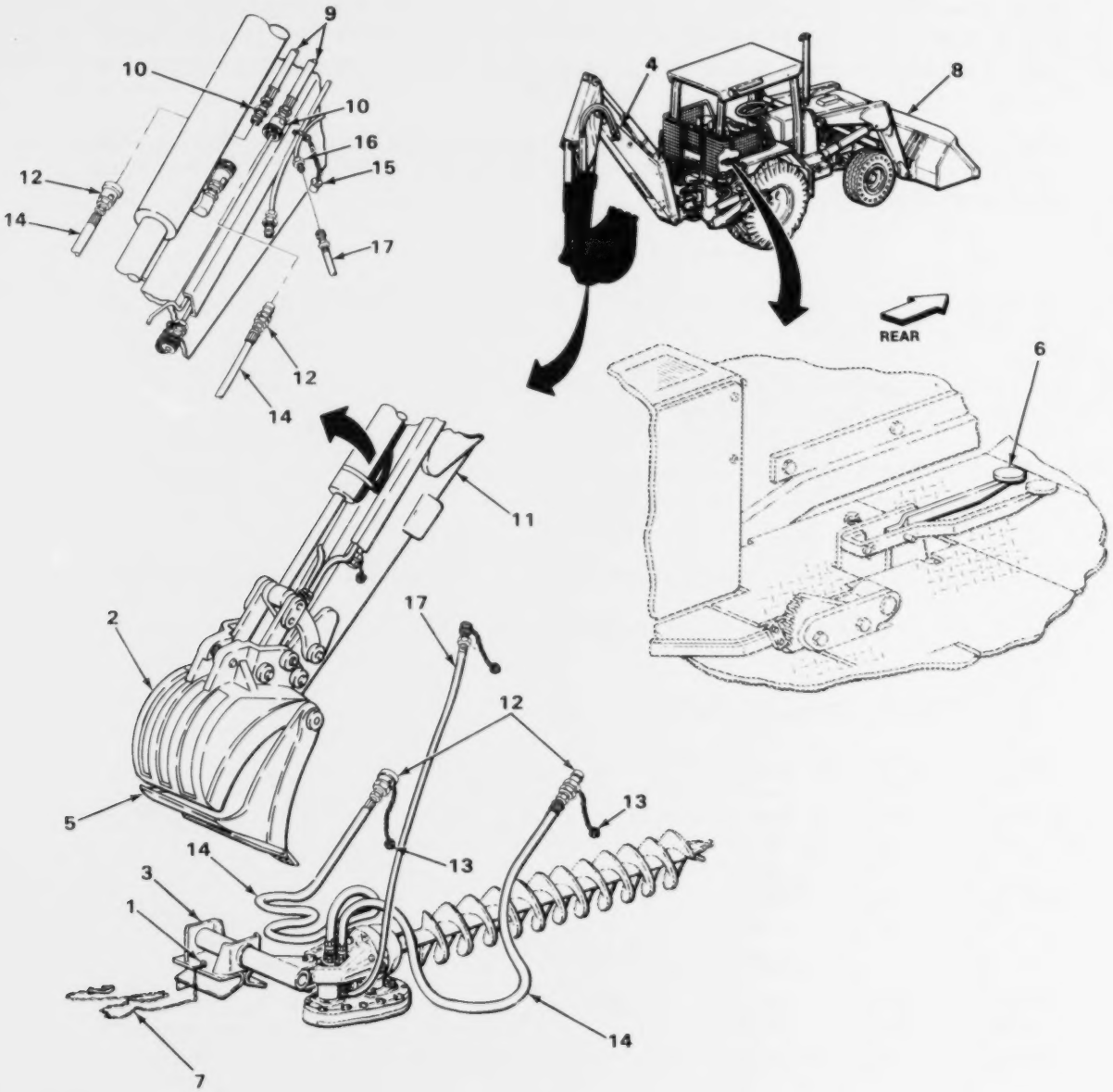
Failure to connect auger motor drain hose to backhoe hydraulic system will lead to seal failure in auger motor.

17. Pull cap (15) off of sump coupler (16).

18. Hydraulic drain hose (17) must be connected to hydraulic sump coupler (16) on dipper-stick (11).

19. Hydraulic earth auger is ready for operation.

HYDRAULIC EARTH AUGER ATTACHMENT INSTALLATION – CONTINUED



TA234837

HYDRAULIC EARTH AUGER ATTACHMENT REMOVAL

To remove earth auger from backhoe, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

When loader backhoe lift cylinders have reached their stroke, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Position loader backhoe at area to remove earth auger so minimal additional movement is required.
2. Lower loader bucket (page 2-83).

NOTE

Do not operate backhoe control unless you are in operator's seat facing backhoe.

For more information on how to operate backhoe controls, see Backhoe Operation (page 2-92).

3. Lower backhoe stabilizers (page 2-91).
4. Extend dipperstick (1) out to full reach.
5. Lower backhoe bucket (2) with attached earth auger to ground, by lowering boom (3). Make sure auger (4) and boring head (5) are on their sides (horizontal to ground).
6. Shut down engine (page 2-67).

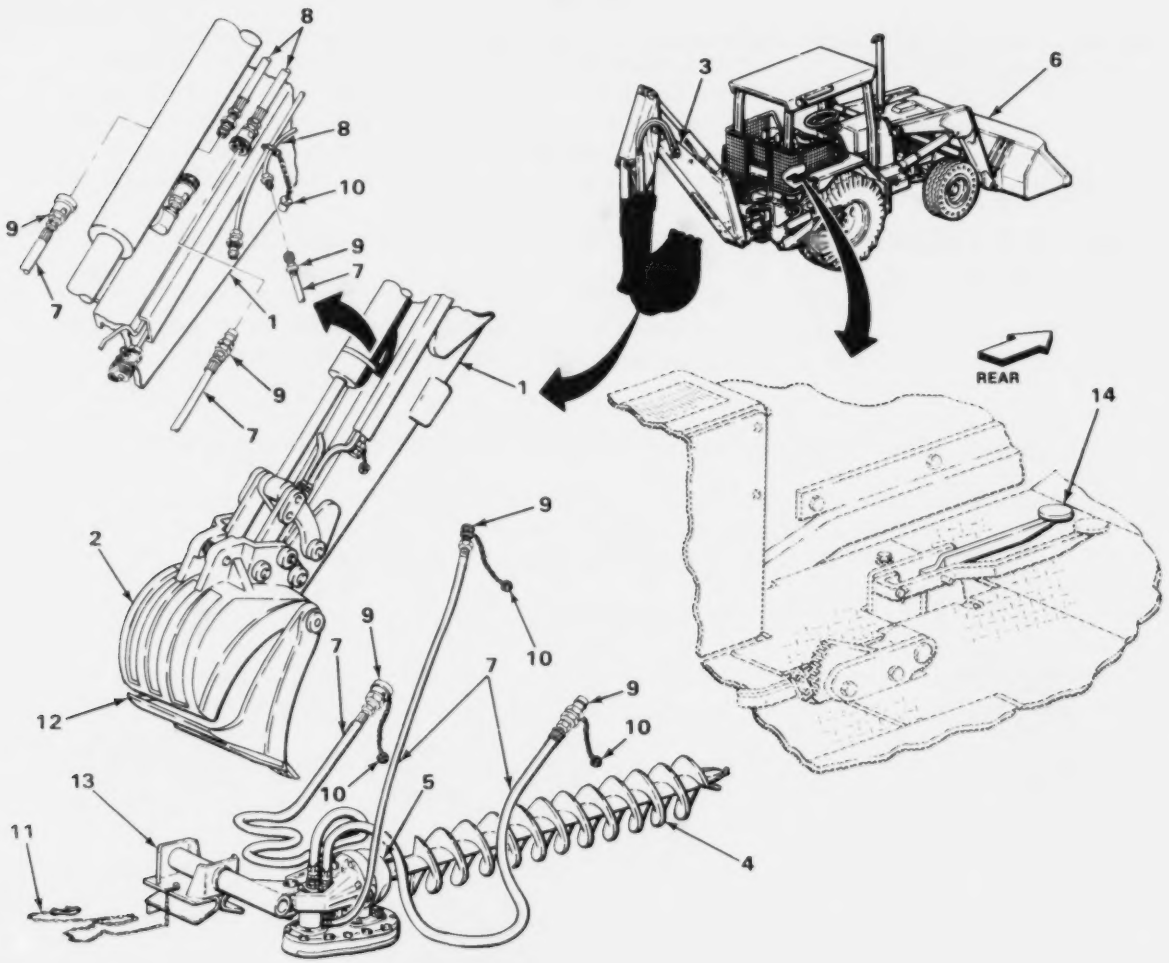
WARNING

When operating earth auger and connecting and disconnecting auger hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

7. Relieve hydraulic system pressure by raising loader bucket (6) until it will not raise any farther, then lower bucket (6) to ground.
8. Disconnect all three hydraulic hoses (7) from earth auger to bucket cylinder hoses (8) and dipperstick (1) using quick disconnect couplings (9).
9. Connect caps (10) on couplings (9) to prevent dirt from entering couplings (9).

HYDRAULIC EARTH AUGER ATTACHMENT REMOVAL – CONTINUED

10. Connect bucket cylinder hoses (8) on dipperstick (1).
11. Disconnect auger's safety chain (11) from leading edge of bucket (2).
12. Start engine (page 2-61).
13. Open jaw (12) on bucket (2) to release auger hitch (13) by pressing down on short jaw bucket pedal (14).
14. Raise boom (3) and retract dipperstick (1) to clear backhoe of earth auger.



TA234838

HYDRAULIC EARTH AUGER ATTACHMENT OPERATION

WARNING

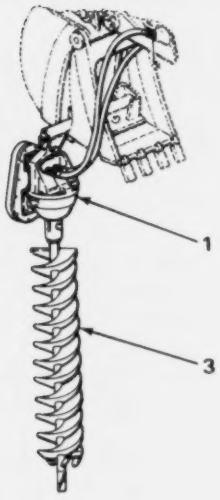
When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

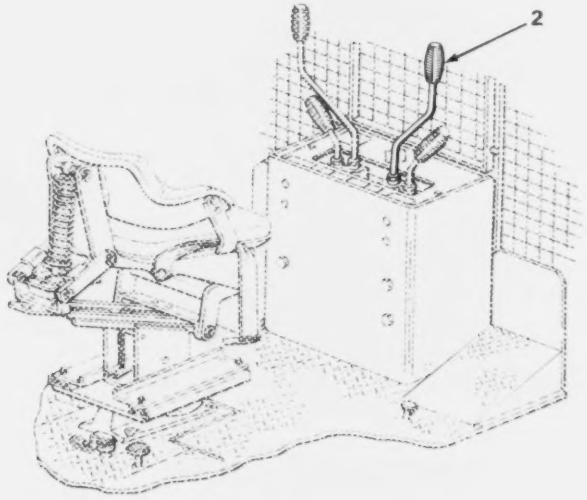
Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Position hydraulic earth auger attachment at desired location by operating backhoe controls (page 2-92).
2. To start auger motor (1), move backhoe bucket control lever (2) to your right for clockwise rotation and to your left for counterclockwise rotation. Return lever (2) to neutral position and auger motor (1) will stop.
3. Earth boring can be done faster if auger (3) is fed slowly into ground and withdrawn to clean, at frequent intervals.
4. When drilling in sand or loose material, holes can be cleaned better if auger (3) is stopped before lifting it from hole, and started suddenly when completely raised, to throw off dirt.
5. If auger (3) gets stuck in hole and cannot be freed, reverse auger rotation by moving bucket control lever (2) to your left.





TA234839

HYDRAULIC IMPACTOR INSTALLATION

To install impactor to backhoe, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Do not use hydraulic impactor when backhoe bucket is in truck loading position (page 2-100). If backhoe bucket position needs to be changed, notify Organizational Maintenance.

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Fill loader bucket (1) with material to add extra weight and stability to front end (page 2-86).
2. Position loader backhoe so that impactor (2) is close enough to backhoe (3) for attachment, approximately 10 to 12 feet (3 to 3.7 m).
3. Lower loader bucket (page 2-83).

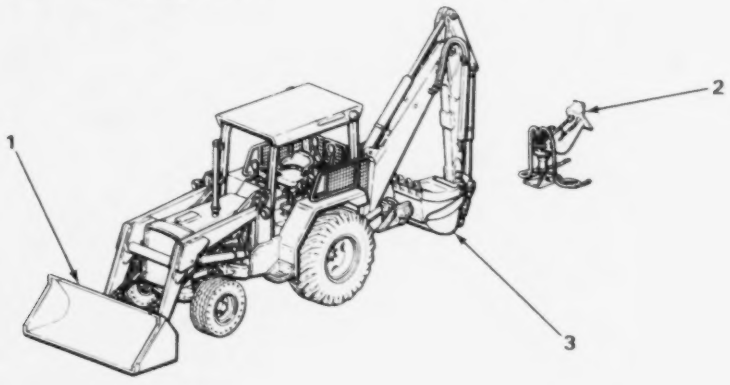
WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

For more information on how to operate backhoe controls, see backhoe operations (page 2-92).

4. Lower backhoe stabilizers (page 2-91).



TA234840

HYDRAULIC IMPACTOR INSTALLATION – CONTINUED

5. If not already removed, remove backhoe lockpins (page 2-123).

WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

6. Place impactor (1) in vertical position, on level ground so that center of impactor hitch (2) is facing bucket jaw (3).

7. Lower bucket (4) until leading edge of jaw (3) has touched vertical hitch rails (5), approximately halfway between moldboard (6) and locking plate (7).

8. Rotate bucket (4) towards vehicle until leading edge of jaw (3) is fully inserted into slot (8).

9. Open bucket (4) while raising bucket (4) until blade (9) is clear of ground. Rear of hitch (2) will swing upward and locking plate (7) will pass to inside bucket section.

10. By pressing down on long jaw bucket pedal (10), close bucket jaw (3), which will securely trap locking plate (7) between bucket (4) and jaw (3).

11. Lower bucket (4) with attached impactor (1) to ground.

12. Shutdown engine (page 2-67).

13. Relieve hydraulic system pressure by raising loader bucket (11) until it will not raise any farther, then lower bucket (11) to ground.

HYDRAULIC IMPACTOR INSTALLATION – CONTINUED

WARNING

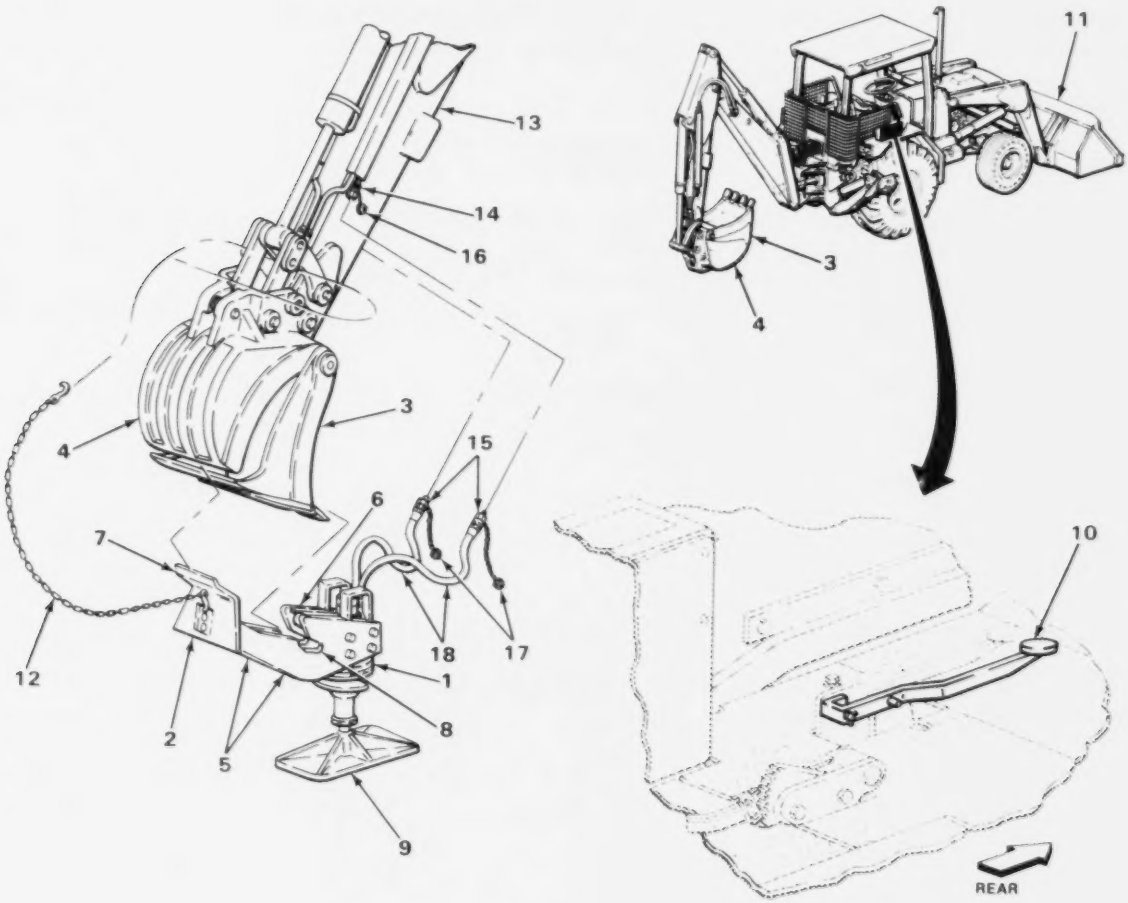
When operating hydraulic impactor and connecting and disconnecting impactor hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

14. Attach safety chain (12) over back of bucket (4) to dipperstick (13).

15. Pull on bottom part of couplings (14) and (15) and pull plugs (16) and (17) out of couplings (14) and (15).

16. Make sure all hydraulic couplings are clean and free of dirt before making connections. Connect two hydraulic hoses (18) to couplings (14) on dipperstick (13).

17. Hydraulic impactor is now ready for operation.



TA234841

HYDRAULIC IMPACTOR REMOVAL

To remove hydraulic impactor from backhoe, do the following:

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

CAUTION

When loader backhoe lift cylinders have reached their stroke limits, allow loader backhoe control levers to return to neutral position. This will prevent hydraulic oil from bypassing valves and reduce heat and wear.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

1. Position loader backhoe at area to remove hydraulic impactor so minimal additional movement is required.
2. Lower loader bucket (page 2-83).

WARNING

Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

For more in information on how to operate backhoe controls, see backhoe operation (page 2-92).

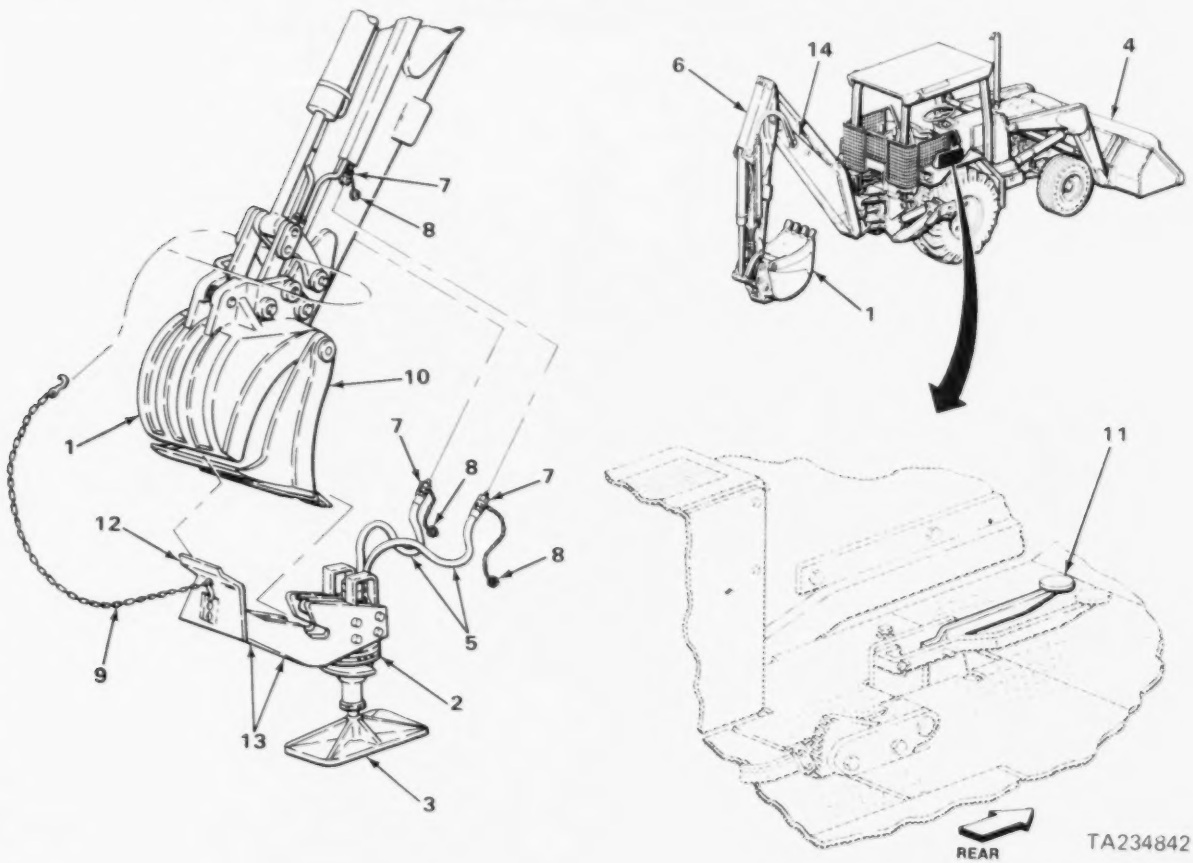
3. Lower backhoe stabilizers (page 2-91).
4. Lower backhoe bucket (1) with attached impactor (2) to ground so that impactor (2) is standing on its blade (3).
5. Shut down engine (page 2-67).
6. Relieve hydraulic pressure by raising loader bucket (4) until it will not raise any farther, then lower bucket (4) to ground.

HYDRAULIC IMPACTOR REMOVAL – CONTINUED

WARNING

When operating hydraulic impactor and connecting and disconnecting impactor hydraulic hoses, gloves and safety goggles should be worn. Hydraulic lines are under pressure. Hydraulic fluid under pressure can penetrate skin causing painful injury.

7. Disconnect two hydraulic hoses (5) from impactor (2) to dipperstick (6), using quick disconnect couplings (7).
8. Connect caps (8) on couplings (7) to prevent dirt from entering couplings (7).
9. Disconnect impactor safety chain (9) from dipperstick (6).
10. Start engine (page 2-61).
11. Open bucket jaw (10), approximately 10 inches (25.4 cm), by pressing down on short jaw bucket pedal (11) to release locking plate (12) from bucket (1).
12. Rotate bucket (1) away from vehicle until leading edge of jaw (10) clears hitch rails (13). Dipperstick (6) may also need to be raised slightly.
13. Raise boom (14) and retract dipperstick (6) to clear backhoe of impactor (2).



HYDRAULIC IMPACTOR OPERATION

WARNING

When operating loader backhoe, make sure that all personnel are cleared from vehicle and work area. Failure to observe this precaution could cause injury to personnel.

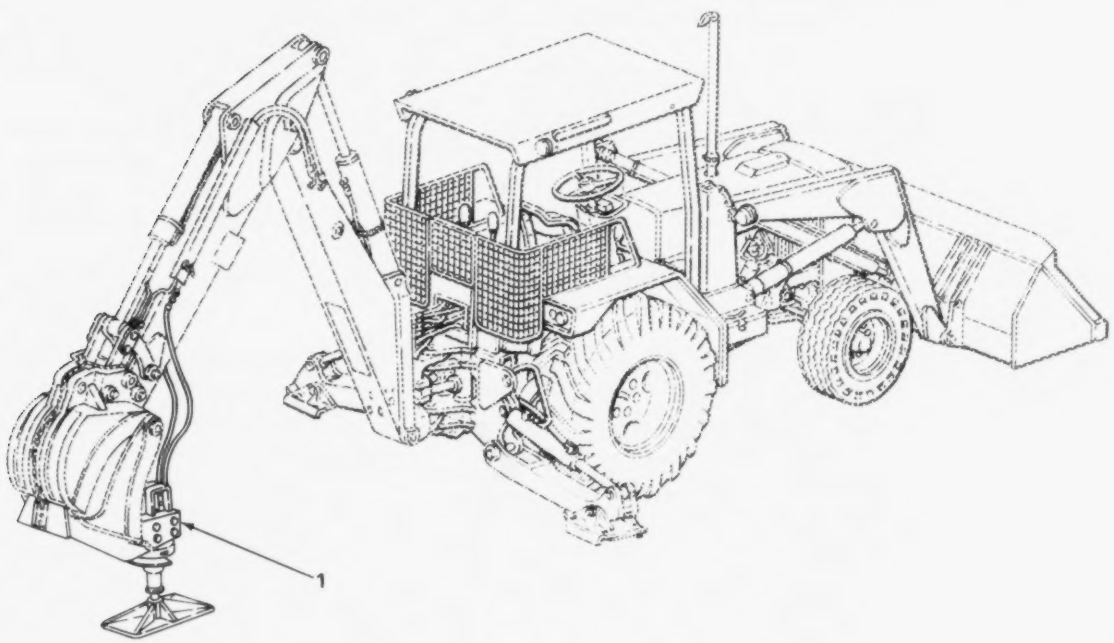
Do not operate backhoe controls unless you are in operator's seat facing backhoe. Backhoe boom cylinder may be accidentally bumped, causing backhoe boom to move suddenly. Failure to observe this precaution could cause serious injury.

NOTE

Loader backhoe engine must be running (page 2-61) for hydraulic components to operate.

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

1. Position impactor (1) to desired location by operating backhoe controls (page 2-92).
2. Set impactor (1) with proper working tool on surface so that impactor (1) and working tool are perpendicular to working surface.
3. Apply preload to impactor (1) and working tool by applying pressure to impactor (1) with backhoe. Maintain constant pressure on impactor during operation.



TA234843

HYDRAULIC IMPACTOR OPERATION – CONTINUED

CAUTION

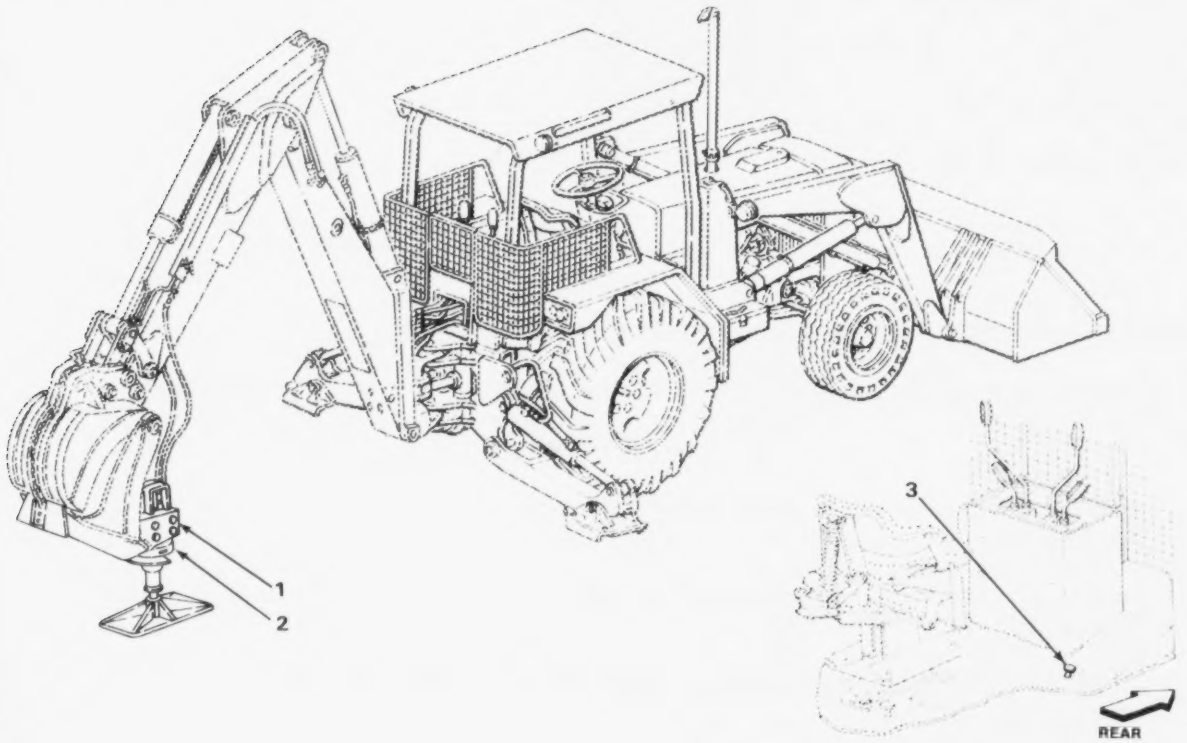
Always maintain preload condition on impactor during operation. If impactor is operated for any length of time in unpreloaded condition, damage could occur to impactor motor.

When hollow sound is heard, impactor is not operating with effective preload. This condition should be corrected by altering attack angle of working tool by small movements of backhoe bucket.

NOTE

Impactor is operable in any position and can effectively be used above or below surface, in horizontal or vertical position.

4. Upon applying preload to impactor (1), start impactor motor (2) by pressing down on flow regulator pedal (3), release pedal (3) and impactor motor (2) will stop.



TA234844

HYDRAULIC IMPACTOR HARD ROCK AND CONCRETE BREAKING

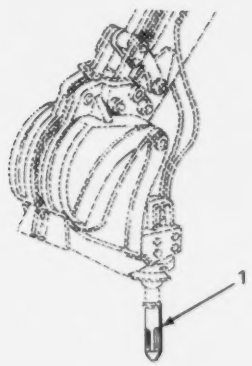
1. Working tool required for hard rock or concrete breaking is the relieved moil (1).

NOTE

If relieved moil needs to be installed on hydraulic impactor, notify Organizational Maintenance.

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

2. Relieved moil (1) consists of hardened steel shaft with finned end bit.
3. Relieved moil (1) is the strongest breaking tool and concentrates on smallest surface area.



HYDRAULIC IMPACTOR GENERAL ROCK AND CONCRETE BREAKING

1. Working tool required for general rock or concrete breaking is the 20° or 30° breaker (1).

NOTE

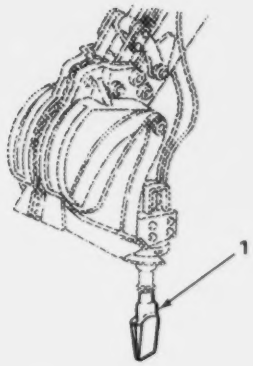
If 20° or 30° breaker needs to be installed to hydraulic impactor, notify Organizational Maintenance.

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

2. The 20° and 30° breaker (1) consists of hardened steel shaft with 2.3125 (5.8737 cm) cutting edge.
3. The 20° and 30° breaker (1) covers largest surface area for breaking rock and concrete.

TA234845

HYDRAULIC IMPACTOR GENERAL ROCK AND CONCRETE BREAKING – CONTINUED



HYDRAULIC IMPACTOR ASPHALT CUTTING

1. Working tool required for cutting lines in asphalt is the asphalt cutter (1).

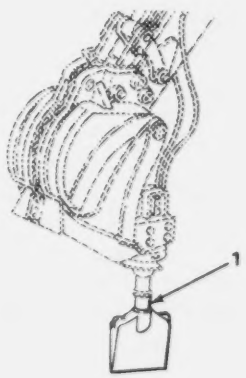
NOTE

If asphalt cutter needs to be installed to hydraulic impactor, notify Organizational Maintenance.

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

2. Asphalt cutter (1) consists of hardened steel shaft with 12-inch (30.5 cm) cutting edge end bit.

3. Asphalt cutter (1) is used to cut predetermined line in asphalt.



TA234846

HYDRAULIC IMPACTOR TAMPING

1. Working tool required for compressing soft surfaces is the tamper (1).

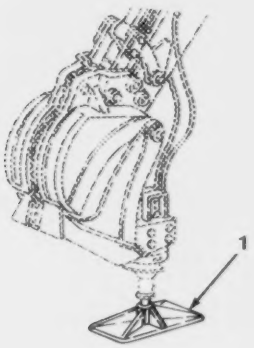
NOTE

If tamper needs to be installed to hydraulic impactor, notify Organizational Maintenance.

For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

2. Tamper (1) consists of hardened steel shaft and foot with surface area of 14.125 x 20-inch (35.878 x 50.8 cm).

3. Tamper (1) is used for compaction of loose dirt or backfilled areas.



HYDRAULIC IMPACTOR POST DRIVER

1. Working tool required for post pounding is the post driver (1).

NOTE

If post driver needs to be installed to hydraulic impactor, notify Organizational Maintenance.

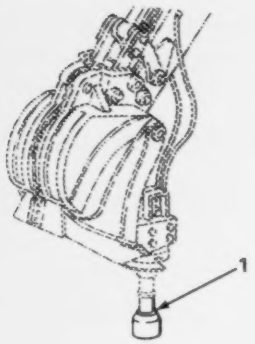
For more information on how to operate backhoe controls, see backhoe operation (page 2-92).

2. Post driver (1) consists of hardened steel shaft with either 3-inch (7.6 cm) or 4-inch (10.2 cm) surface diameter end bits.

3. Post driver (1) is used driving post and can be used in vertical or horizontal position. There are two different size post drivers (1) available, depending on post diameters.

TA234847

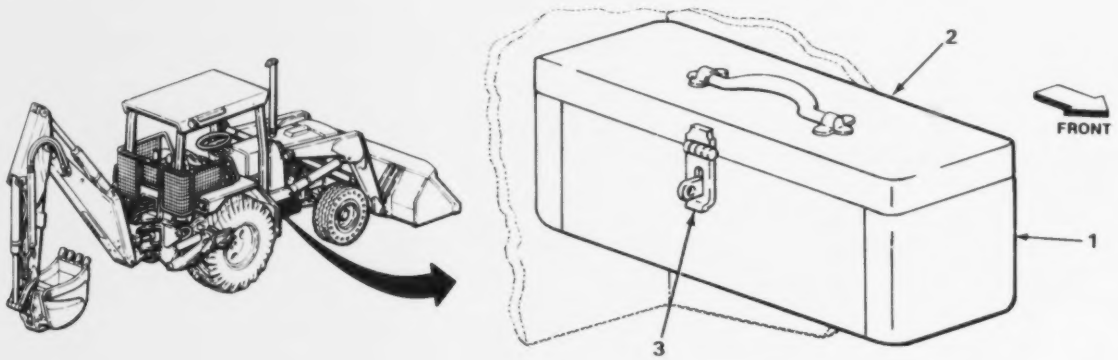
HYDRAULIC IMPACTOR POST DRIVER – CONTINUED



SHORT DISTANCE MOVE

If loader backhoe is to be moved only a short distance, it can be driven under its own power. To move loader backhoe a short distance, do the following:

1. Perform Preventive Maintenance Checks and Services (PMCS) (page 2-10).
2. Lubricate loader backhoe if necessary (LO 5-2420-222-12).
3. Install backhoe lockpins (page 2-123).
4. Raise loader bucket (page 2-83) high enough for good ground clearance but low enough for good visibility.
5. Raise both stabilizers (page 2-91).
6. Make sure loader backhoe lubrication equipment and publications are clean and stowed in toolbox (1).
7. Close toolbox cover (2) and padlock toolbox clasp (3).
8. Loader backhoe is ready to be driven to new worksite.
9. Upon completion of short distance move, remove backhoe lockpins (page 2-123).



TA234848

LONG DISTANCE MOVE

Long distance movement of loader backhoe should be done with proper transportation equipment, such as flatbed trailer, railroad car, or carrier. To move loader backhoe a long distance, do the following:

1. Perform Preventive Maintenance Checks and Services (PMCS) (page 2-10).
2. Lubricate loader backhoe, if necessary (LO 5-2420-222-12).
3. Install backhoe lockpins (page 2-123).
4. Raise stabilizers (page 2-91).
5. Raise loader bucket (page 2-83) high enough for good ground clearance but low enough for good visibility.
6. Loader backhoe is prepared for loading.

NOTE

If driving loader backhoe on carrier, do step 7.

If loading by lifting, skip step 7.

7. Drive loader backhoe slowly up ramp so that approximate center line of loader backhoe is in line with approximate center line of trailer bed. Go to step 12.
8. Position loader backhoe close to carrier and make sure lifting device has a minimum lifting capacity of 20,000 lb (9,080 kg).

NOTE

Lifting and tiedown points are the same on both sides of loader backhoe. One side is shown.

9. Connect lifting sling hooks to two front sling points (1) and to two rear sling points (2) observing information on lifting and tiedown data plate (3).

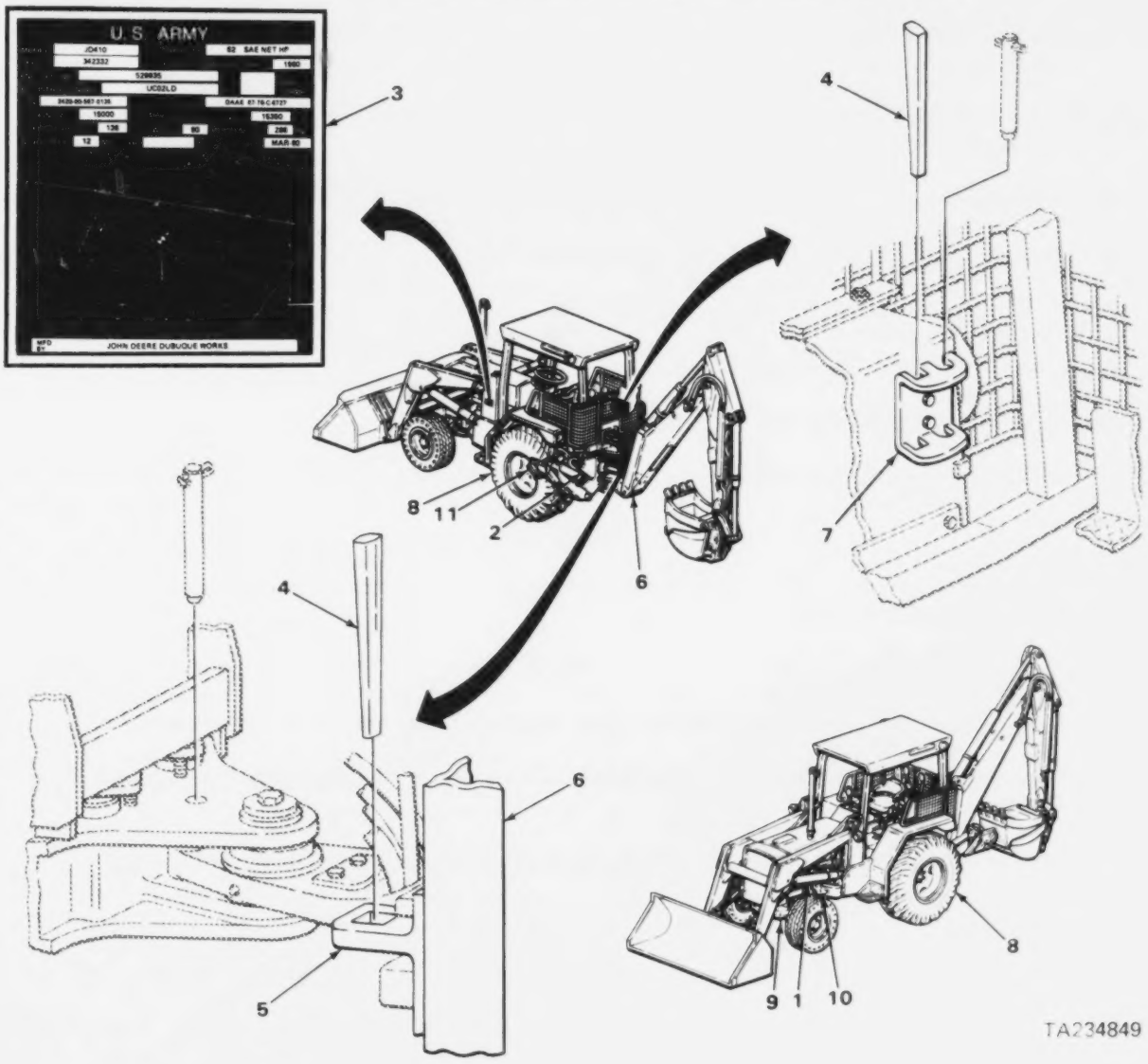
WARNING

Keep all personnel clear of working area during lift. Slings could break and cause serious injury and death.

10. Have loader backhoe lifted and carefully placed in position by Organizational Maintenance so that approximate center of loader backhoe is in line with approximate center line of carrier.
11. Take off lifting sling hooks from two front sling points (1) and two rear sling points (2).

LONG DISTANCE MOVE – CONTINUED

12. Lower loader bucket (page 2-83).
13. Lower stabilizers (page 2-91), and secure red signal flags.
14. Pull boom lockpin (4) out of eyelet (5) of boom (6).
15. Place boom lockpin (4) in bracket (7) inside of cab.
16. Lower backhoe (page 2-92).
17. Put blocks in front of and behind all tires (8).
18. Connect tiedowns to two front tiedown points (9), two middle tiedown points (10), and two rear tiedown points (11) observing information on lifting and tiedown data plate (3).



TA234849

LONG DISTANCE MOVE – CONTINUED

19. Install preservative covers (page 2-122).

20. Loader backhoe is ready for long distance move on carrier.

NOTE

Steps 21 and 22 apply only to loader backhoes that are unloaded by lifting.

21. Position carrier close to lifting device with minimum lifting capacity of 20,000 lb (9,080 kg).

NOTE

Lifting and tiedown points are the same on both sides of loader backhoe. One side is shown.

22. Connect lifting sling hooks to two front sling points (1) and to two rear sling points (2) observing information on lifting and tiedown data plate (3).

23. Remove tiedowns from two front tiedown points (4), two middle tiedown points (5), and two rear tiedown points (6).

24. Raise backhoe boom as far as it will go (page 2-92).

25. Remove boom lockpin (7) from bracket (8) inside of cab.

26. Slide boom lockpin (7) in eyelet (9) of boom (10).

27. Raise loader bucket (page 2-83).

28. Remove red signal flags and raise stabilizers (page 2-91).

29. Take out blocks from in front of and behind all tires (11).

WARNING

Keep all personnel clear of working area during lift. Slings could break and cause serious injury and death.

NOTE

Steps 30 and 31 apply only to loader backhoes that are unloaded by lifting.

30. Have loader backhoe lifted from carrier and carefully placed on ground by Organizational Maintenance.

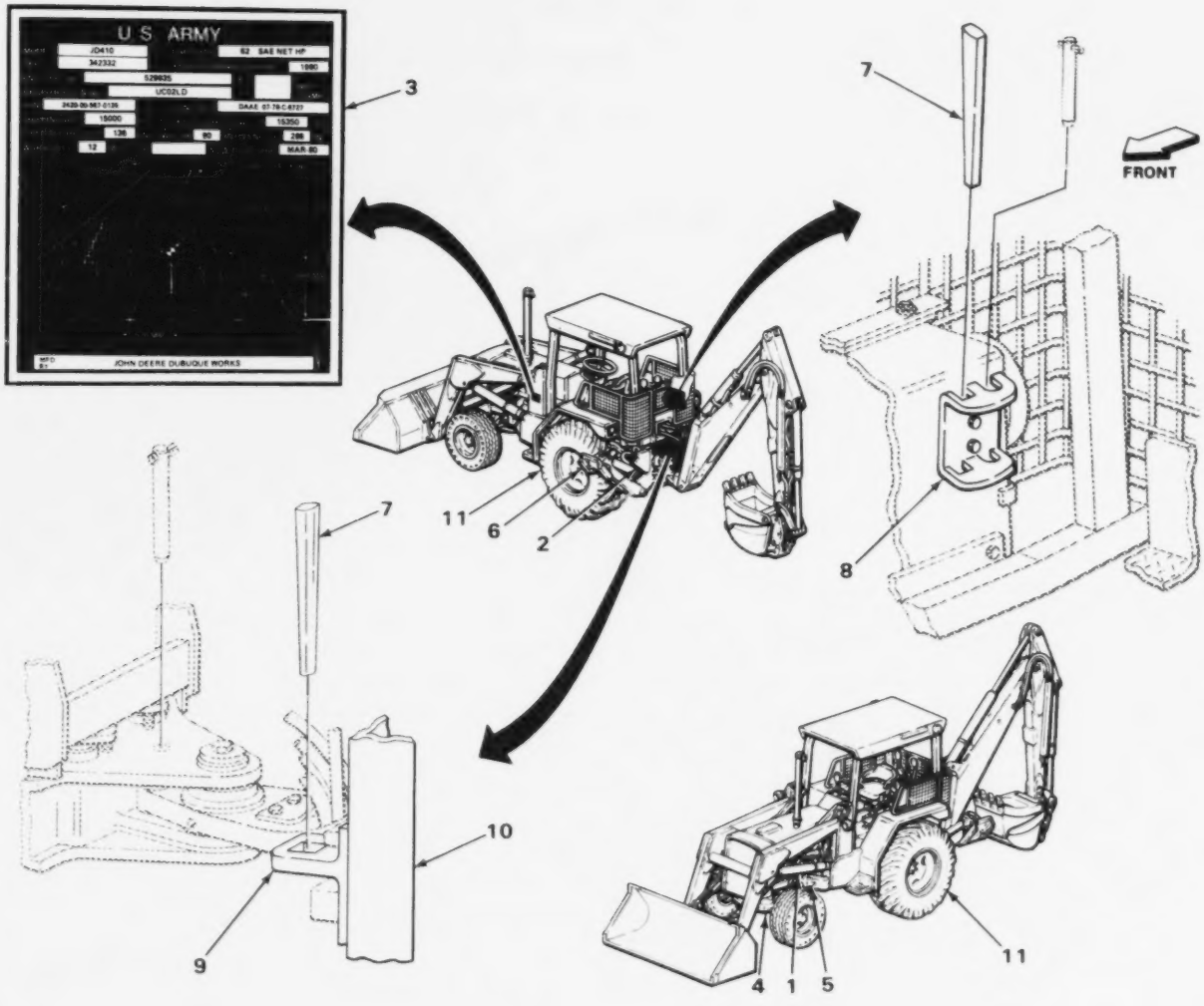
31. Take off lifting sling hooks from two front sling points (1) and two rear sling points (2).

LONG DISTANCE MOVE – CONTINUED

NOTE

Step 32 applies only to loader backhoes that are driven off of carrier.

32. Slowly drive loader backhoe off of carrier and down ramp.
33. Remove preservative covers (page 2-122).
34. Remove backhoe lockpins (page 2-123).
35. Loader backhoe is ready for operation.



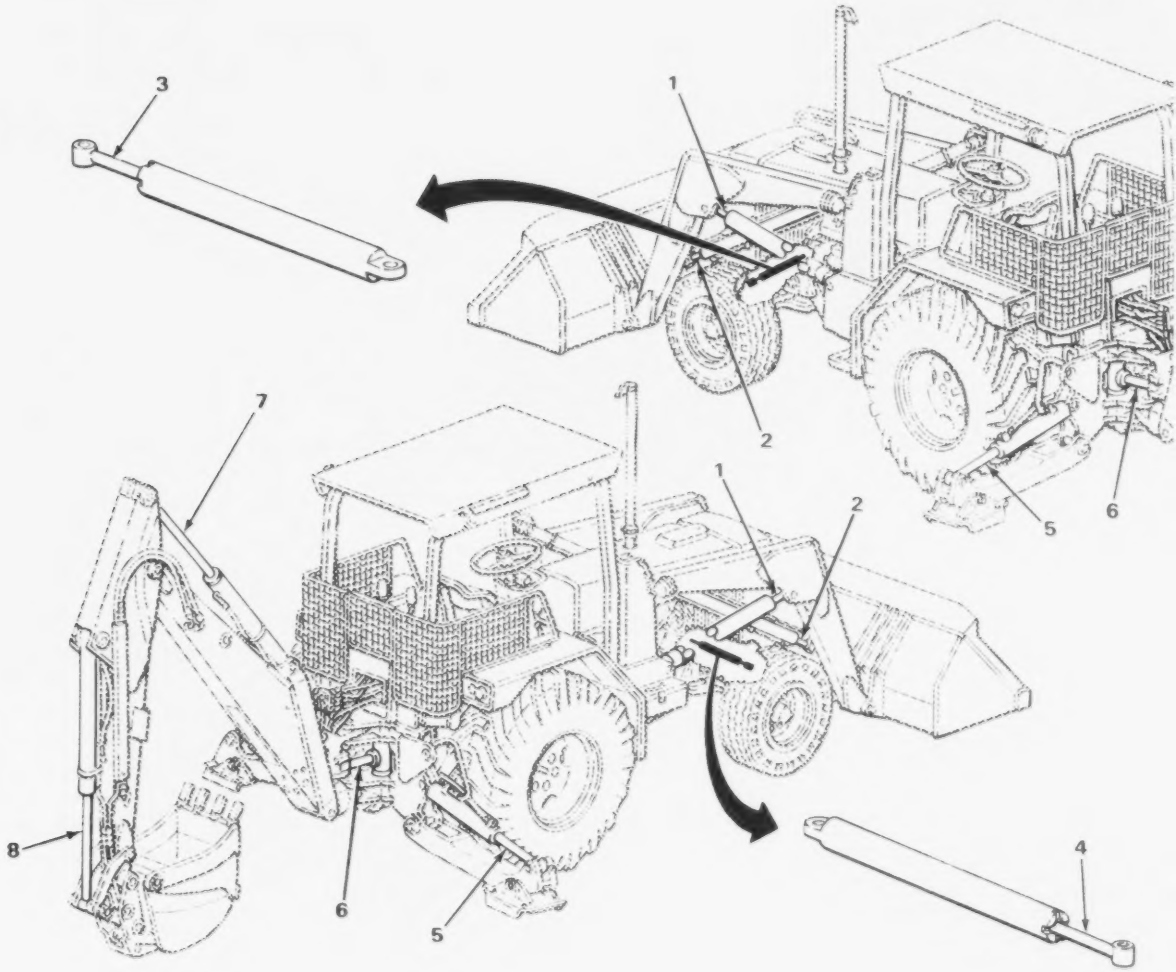
TA234850

PRESERVATIVE COVER INSTALLATION

Use pressure sensitive tape (item 10, appendix D) and seal two loader boom cylinder push rods (1), two loader bucket cylinder push rods (2), left steering cyiinder push rod (3), right steering cylinder push rod (4) (Serial Numbers 235786 thru 235999 only), two stabilizer cylinder push rods (5), two backhoe swing cylinder push rods (6), backhoe crowd cylinder push rod (7) and backhoe bucket cylinder push rod (8).

PRESERVATIVE COVER REMOVAL

Take off tape from two loader boom cylinder push rods (1), two loader bucket cylinder push rods (2), left steering cylinder push rod (3), right steering cylinder push rod (4) (Serial Numbers 235786 thru 235999 only), two stabilizer cylinder push rods (5), two backhoe swing cylinder push rods (6), backhoe crowd cylinder push rod (7) and backhoe bucket cylinder push rod (8).



TA234851

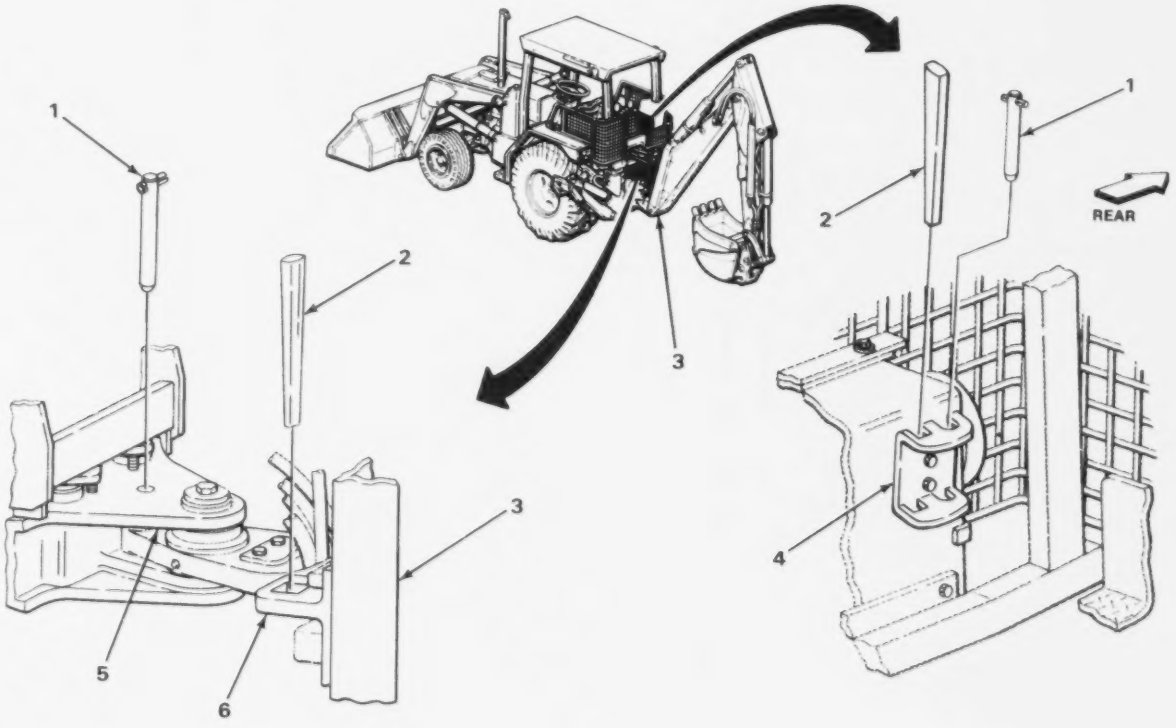
BACKHOE LOCKPINS

Backhoe lockpins (1) and (2) keep backhoe boom (3) from moving up and down and from side to side when driving or moving loader backhoe. Install backhoe lockpins (1) and (2) as follows:

1. Remove swing lockpin (1) and boom lockpin (2) from bracket (4) inside of cab.
2. Operate backhoe (page 2-92) so boom (3) is raised as far as it will go and centered.
3. Slide swing lockpin (1) into hole in backhoe frame (5).
4. Slide boom lockpin (2) into eyelet (6) of boom (3).

Remove backhoe lockpins (1) and (2) as follows:

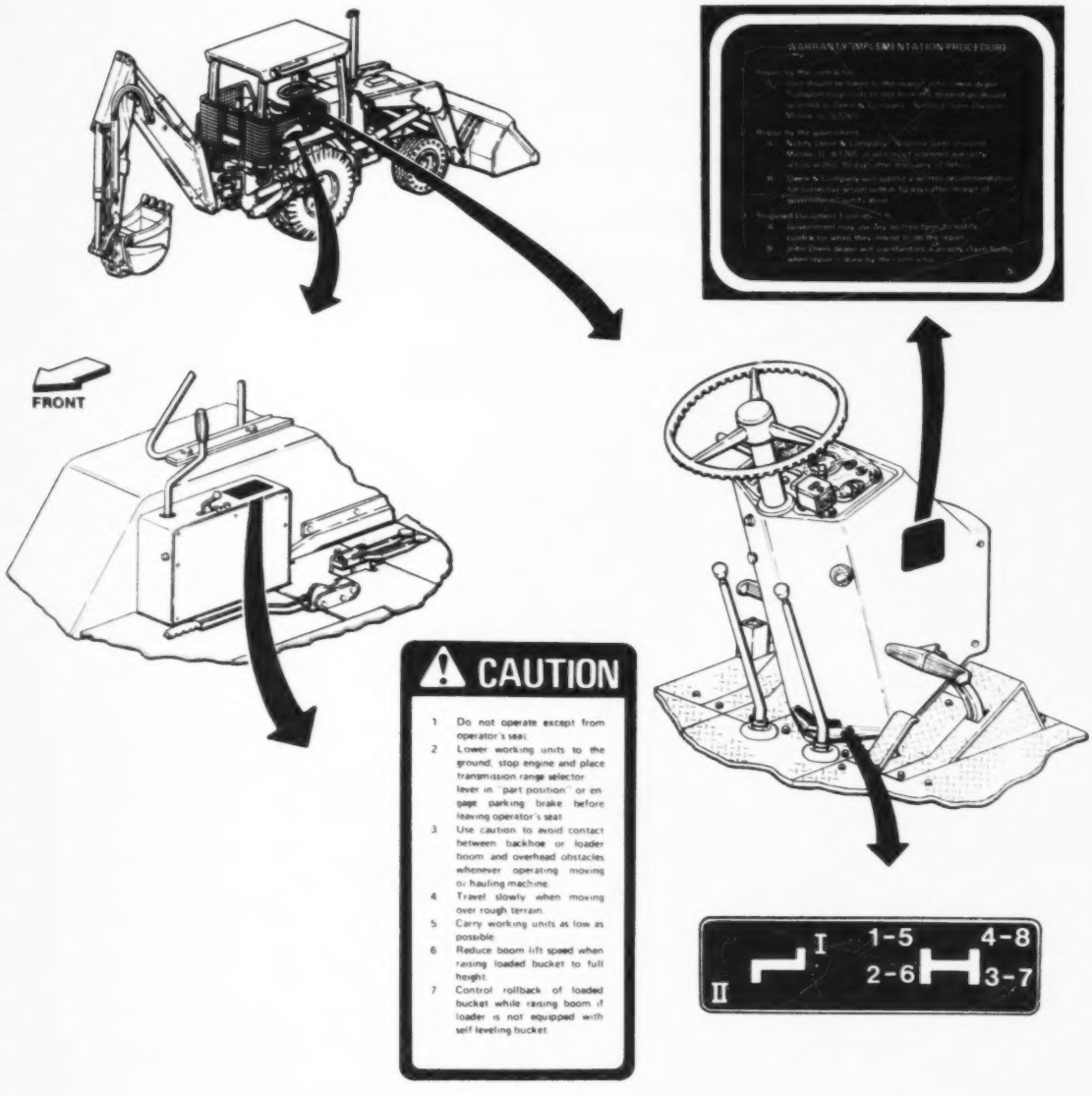
1. Pull swing lockpin (1) out of hole in backhoe frame (5).
2. Pull boom lockpin (2) out of eyelet (6) of boom (3).
3. Place swing lockpin (1) and boom lockpin (2) in bracket (4) inside of cab.



TA234852

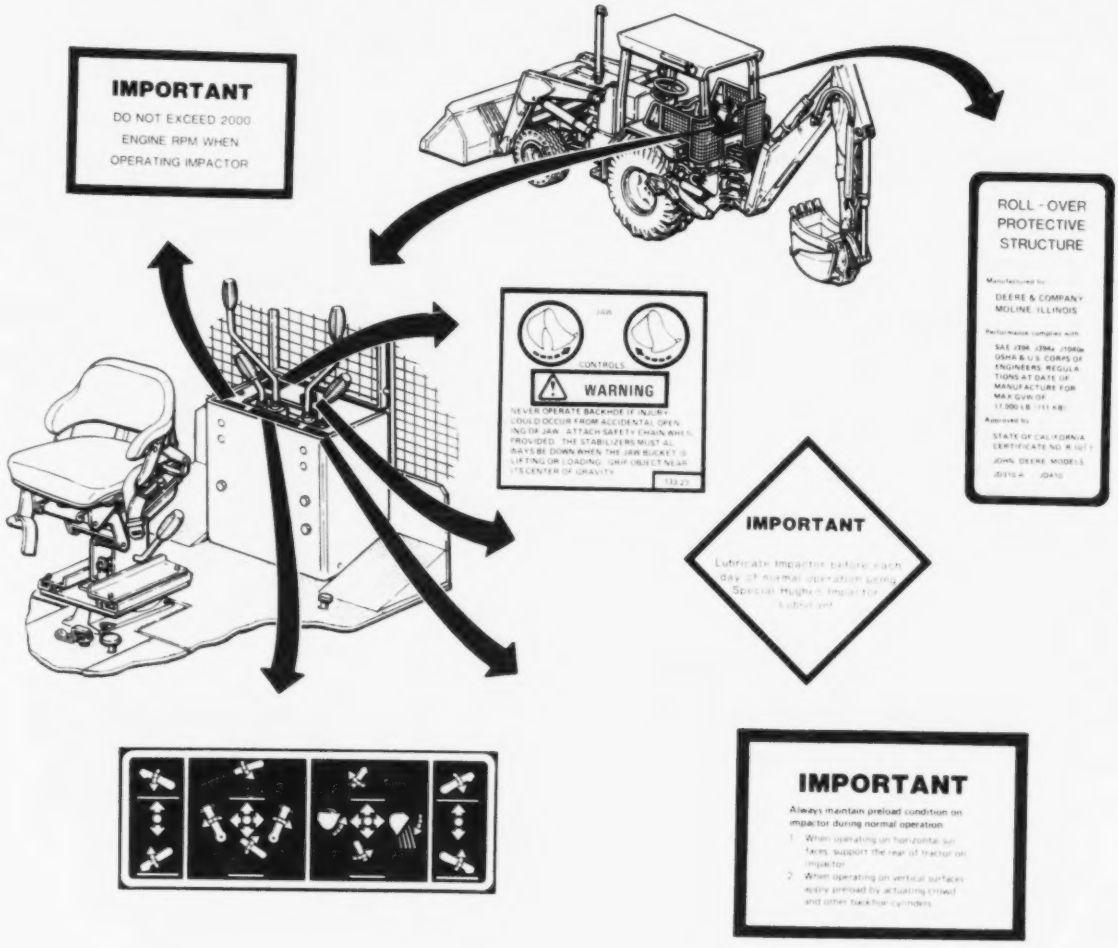
INTERIOR DATA PLATES AND DECALS

These metal data plates and self-adhesive decals are attached to surfaces inside cab and provide necessary information for operation and maintenance of loader backhoe. Interior data plates and decals are located and illustrated below and on the following pages in case wear or other damage has made them difficult to read.


FRONT
CAUTION
1 Do not operate except from operator's seat.
2 Lower working units to the ground, stop engine and place transmission range selector lever in "part position" or engage parking brake before leaving operator's seat.
3 Use caution to avoid contact between backhoe or loader boom and overhead obstacles whenever operating, moving or hauling machine.
4 Travel slowly when moving over rough terrain.
5 Carry working units as low as possible.
6 Reduce boom lift speed when raising loaded bucket to full height.
7 Control rollback of loaded bucket while raising boom if loader is not equipped with self-leveling bucket.
I
1-5
4-8
2-6
3-7
II

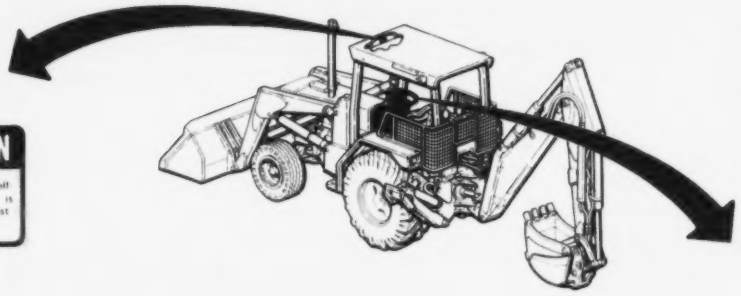
TA234853

INTERIOR DATA PLATES AND DECALS – CONTINUED



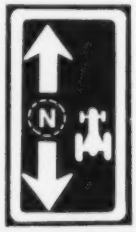
TA234854

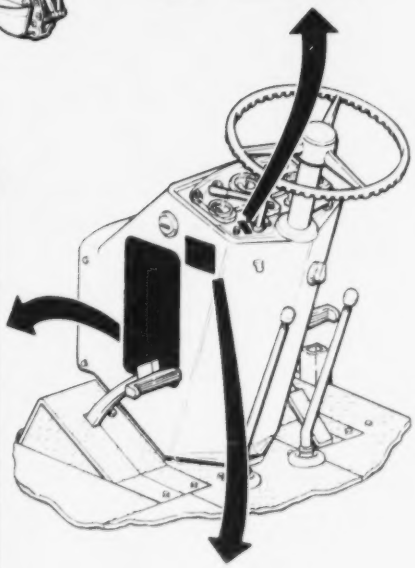
INTERIOR DATA PLATES AND DECALS – CONTINUED



CAUTION

Use of seat belt with this roll over protective structure is recommended underalmost all operating conditions.





PERIODIC SERVICE CHART

REFER TO OPERATOR'S MANUAL FOR MORE DETAILED INFORMATION

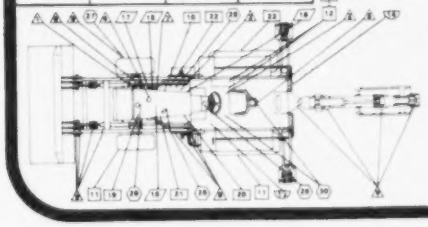
INTERVAL HOURS	ITEM NO.	COMPONENTS	SERVICE POINTS	DESCRIPTION OF SERVICE	CAPACITY OR MEASUREMENT	APPROVED SERVICE MATERIAL
△ 10 OR DAILY	1	AIR CLEANER	1	CHECK UNLOADER VALVE RESTRICTION INDICATOR AND CLEAN ELEMENT AS REQUIRED	OPERATOR'S MANUAL	
	2	TRANSMISSION SYSTEM	1	CHECK OIL LEVEL	TO TOP MARK WITH DIPSTICK RESTING ON TOP OF FILLER TUBE	HY GARD OR EQUIVALENT
	3	RADIATOR	1	CHECK COOLANT LEVEL DRAIN AND REFILL SPRING AND FALL	MIDWAY BETWEEN CORE AND FILLER NECK	OPERATOR'S MANUAL
	4	FUEL FILTER	1	REPLACE AS REQUIRED	OPERATOR'S MANUAL	
	5	SEAT	1	LUBRICATE SWIVEL LOCKING PIN, SLIDE PLATE AND ADJUSTERS	OPERATOR'S MANUAL	ENGINE OIL AND SAE MPG
	6	FRONT AXLE AND STEERING CYLINDERS	9 (0310) 8 (0410)	LUBRICATE	SEVERAL SHOTS	SAE MPG
	7	ENGINE CRANKCASE	1	CHECK OIL LEVEL	BETWEEN MARKS ON DIPSTICK	SEE OIL CHART
	8	FRONT WHEELS	2	SERVICE ONLY WHEN UNIT IS BEING OPERATED IN EXTREME WET AND MUDDY CONDITIONS	OPERATOR'S MANUAL	
	9	LOADER BACKHOE PIVOT POINTS**	1	LUBRICATE FITTINGS	2 SHOTS	SAE MPG
	10	CAPSCREWS AND BOLTS		CHECK FOR TIGHTNESS	OPERATOR'S MANUAL	
□ 50	11	TIRES	4	CHECK AIR PRESSURE	OPERATOR'S MANUAL	
	12	TRANSMISSION AND HYDRAULIC SYSTEM	2	REPLACE 2 FILTER ELEMENTS (BREAK-IN ONLY	OPERATOR'S MANUAL	
⌓ 100	13	BATTERY	1	CHECK ELECTROLYTE LEVEL AND TERMINALS	TO BOTTOM OF FILLER NECK REMOVE ANY CORROSION	
	14	LOCKING CYLINDER PINS*	2	LUBRICATE FITTINGS	1 SHOT OF GREASE	
▱ 200	15	ENGINE CRANKCASE	2	DRAIN, REFILL AND REPLACE FILTER ELEMENT	SEE CHART BELOW	SEE OIL CHART OIL FILTER
	16	ACCUMULATOR	1	CHECK ACTION	OPERATOR'S MANUAL	
	17	ALTERNATOR FAN BELT	1	CHECK TENSION	3 8 INCH (9 mm) FLEX WITH 20 LB (89 N) FORCE	
▭ 500	18	SPARK PLUGS	4	CLEAN AND SET GAPS	OPERATOR'S MANUAL	
	19	AIR INTAKE HOSES	3	CHECK CONNECTIONS		DIESEL FUEL
	20	CRANKCASE VENT TUBE	1	REMOVE AND CLEAN		
	21	CARBURETOR STRAINER	1	CLEAN INLET STRAINER SCREEN		
	22	DISTRIBUTOR CAM POINTS TIMING	1	LUBRICATE CAM SET CAM CHECK TIMING	TRACE OPERATOR'S MANUAL OPERATOR'S MANUAL	CAM LUBRICANT OR HIGH TEMPERATURE GREASE (SAE MPG)
	23	REAR AXLE BEARINGS	2	LUBRICATE BEARINGS	6 SHOTS	OPERATOR'S MANUAL
	24	TRANSMISSION AND HYDRAULIC SYSTEM	2	REPLACE ELEMENTS	OPERATOR'S MANUAL	
⬡ 1000	25	ENGINE VALVE TAPPETS	1	ADJUST CLEARANCE	OPERATOR'S MANUAL	OPERATOR'S MANUAL
	26	ENGINE SPEEDS	1	CHECK SPEEDS		SAE MPG
	27	FRONT WHEEL BEARINGS	2	CLEAN REPACK AND ADJUST	OPERATOR'S MANUAL	
	28	MAIN HYDRAULIC PUMP	1	CLEAN STROKE CONTROL VALVE FILTER	SEE YOUR JOHN DEERE DEALER FOR THIS SERVICE	
	29	STARTER (DIESEL)	1	LUBRICATE WICKS	SATURATE WICKS	10W (SE CD)
	30	TRANSMISSION SYSTEM	2	DRAIN AND REFILL CLEAN INTAKE SCREEN	10 GAL (38 L)	HY GARD OR EQUIVALENT

ENGINE OIL

AIR TEMP	JOHN DEERE TORQ GARD OIL	SINGLE VISCOSITY OIL API SERVICE CC OR SD	MULTI VISCOSITY OIL API SERVICE CC OR SD
ABOVE 32° F (0° C)	SAE 30	SAE 30	NOT RECOMMENDED
32° F TO 10° F (0° C TO -23° C)	SAE 10W 30	SAE 10W	SAE 10W 30 SAE 10W 30
BELOW 10° F (-23° C)	SAE 5W 20	SAE 5W	SAE 5W 20

CAPACITIES

ITEM	0310 A U.S. MEASURE	0310 A METRIC	0410 U.S. MEASURE	0410 METRIC
FUEL TANK	18.5 GAL	70 L	18 GAL	68 L
COOLING SYSTEM	14 QT	13 L	13 QT	12 L
ENGINE CRANKCASE	5 QT	5 L	5 QT	5 L
TRANSMISSION REFILL QUANTITY+	10 GAL	38 L	10 GAL	38 L



REPLACE ELEMENT ANNUALLY OR AS REQUIRED WITH JD FILTER
LUBRICATE BUCKET PIVOT POINTS EVERY HOURS UNDER ADVERSE CONDITIONS

WHEN BACKHOE LOADER IS USED DURING FREEZING AIR TEMPERATURES BELOW 0° F (-23° C) CHANGE OIL FILTER EVERY 100 HOURS OF OPERATION OR EVERY 3 WEEKS OF INTERMITTENT OPERATION WHICHEVER OCCURS FIRST

10 LOADER
21 BACKHOE
23 BACKHOE
17 BACKHOE

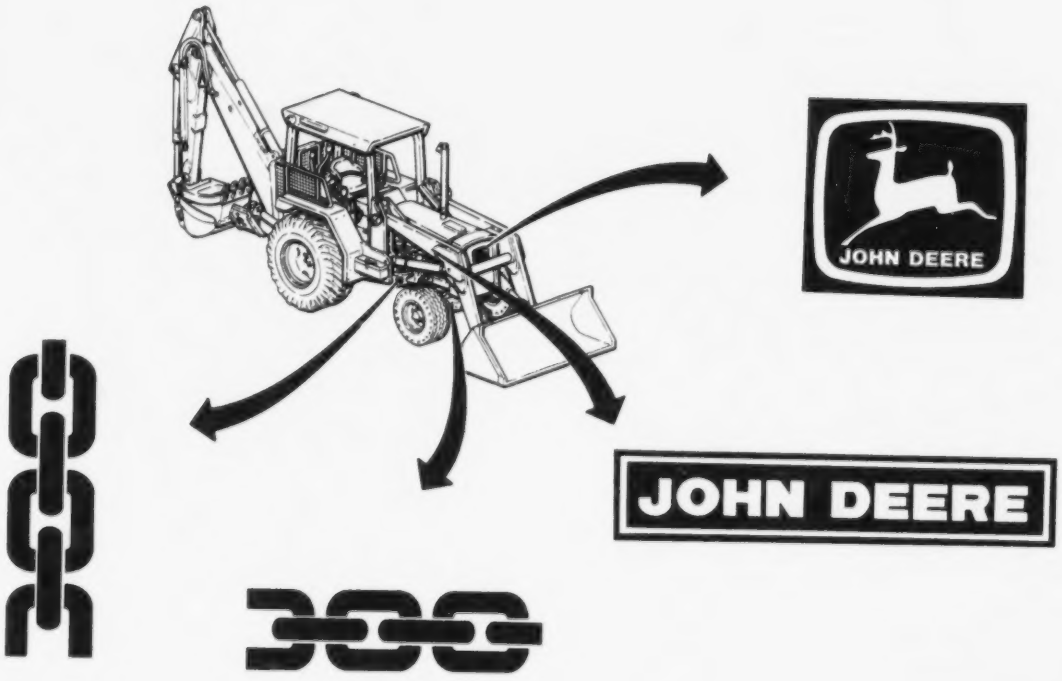
CAUTION

Hearing protection required when operating tractor.

TA234855

EXTERIOR DATA PLATES, DECALS, AND STENCILS

These metal data plates, self-adhesive decals, and painted stencils are applied to exterior surface of loader backhoe components. They provide necessary information for operation and maintenance of loader backhoe. Exterior data plates, decals, and painted stencils are located and illustrated below and on the following pages in case wear or other damage has made them difficult to read.

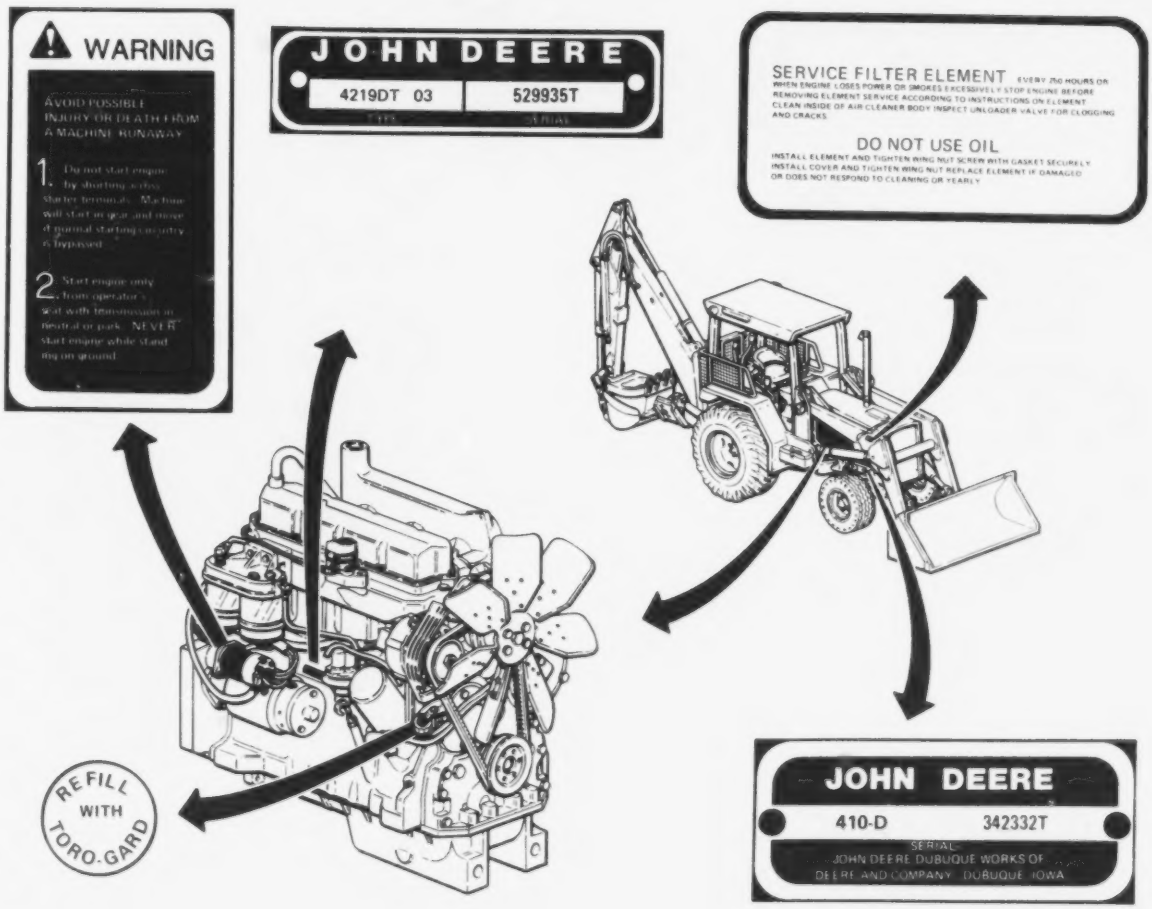


TA234856

EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED

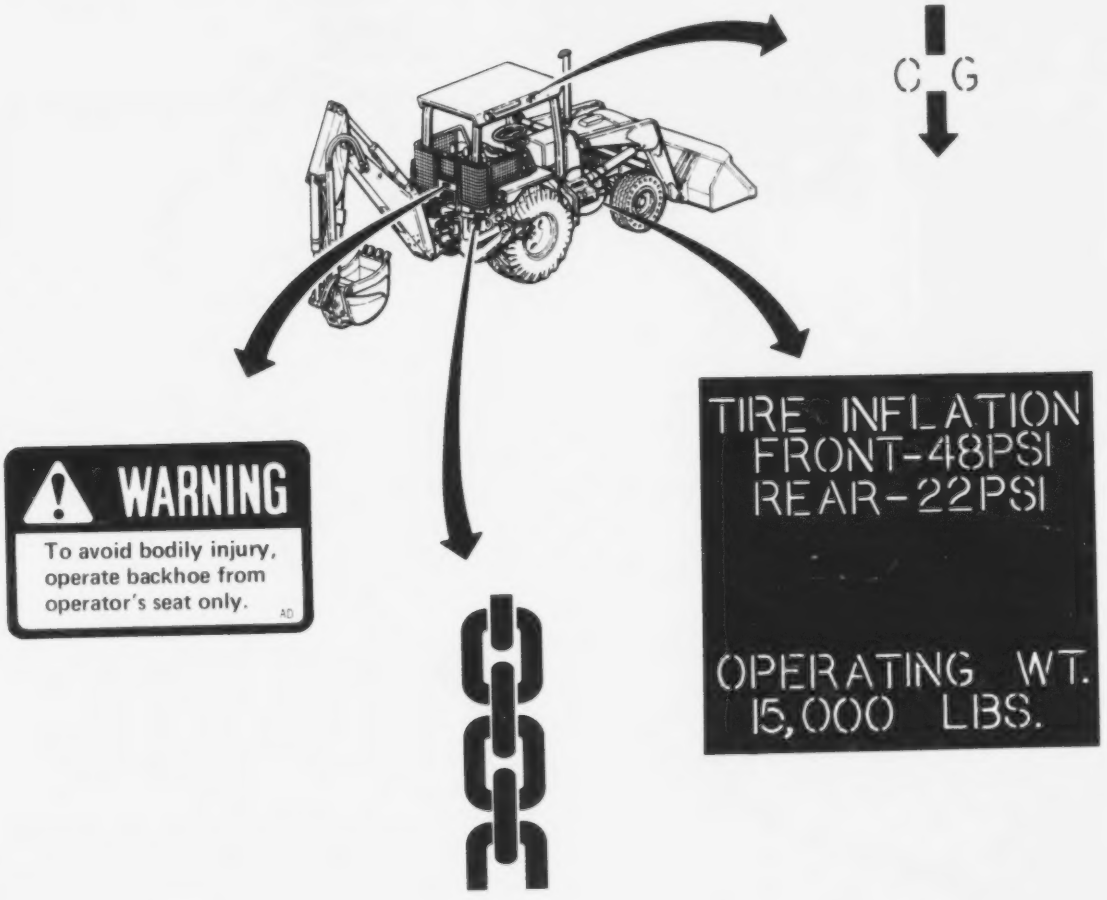
TA234857

EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED


WARNING
AVOID POSSIBLE INJURY OR DEATH FROM A MACHINE RUNAWAY
1. Do not start engine by shorting across starter terminals. Machine will start in gear if normal starting circuitry is bypassed.
2. Start engine only from operator's seat with transmission in neutral or park. NEVER start engine while standing on ground.
JOHN DEERE
4219DT 03
529935T
TYPE
SERIAL
SERVICE FILTER ELEMENT EVERY 250 HOURS OR WHEN ENGINE LOSES POWER OR SMOKES EXCESSIVELY STOP ENGINE BEFORE REMOVING ELEMENT SERVICE ACCORDING TO INSTRUCTIONS ON ELEMENT CLEAN INSIDE OF AIR CLEANER BODY INSPECT UNLOADER VALVE FOR CLOGGING AND CRACKS
DO NOT USE OIL
INSTALL ELEMENT AND TIGHTEN WING NUT SCREW WITH GASKET SECURELY INSTALL COVER AND TIGHTEN WING NUT REPLACE ELEMENT IF DAMAGED OR DOES NOT RESPOND TO CLEANING OR YEARLY
REFILL WITH TORO-GARD
JOHN DEERE
410-D
342332T
SERIAL
JOHN DEERE DUBUQUE WORKS OF DEERE AND COMPANY DUBUQUE IOWA

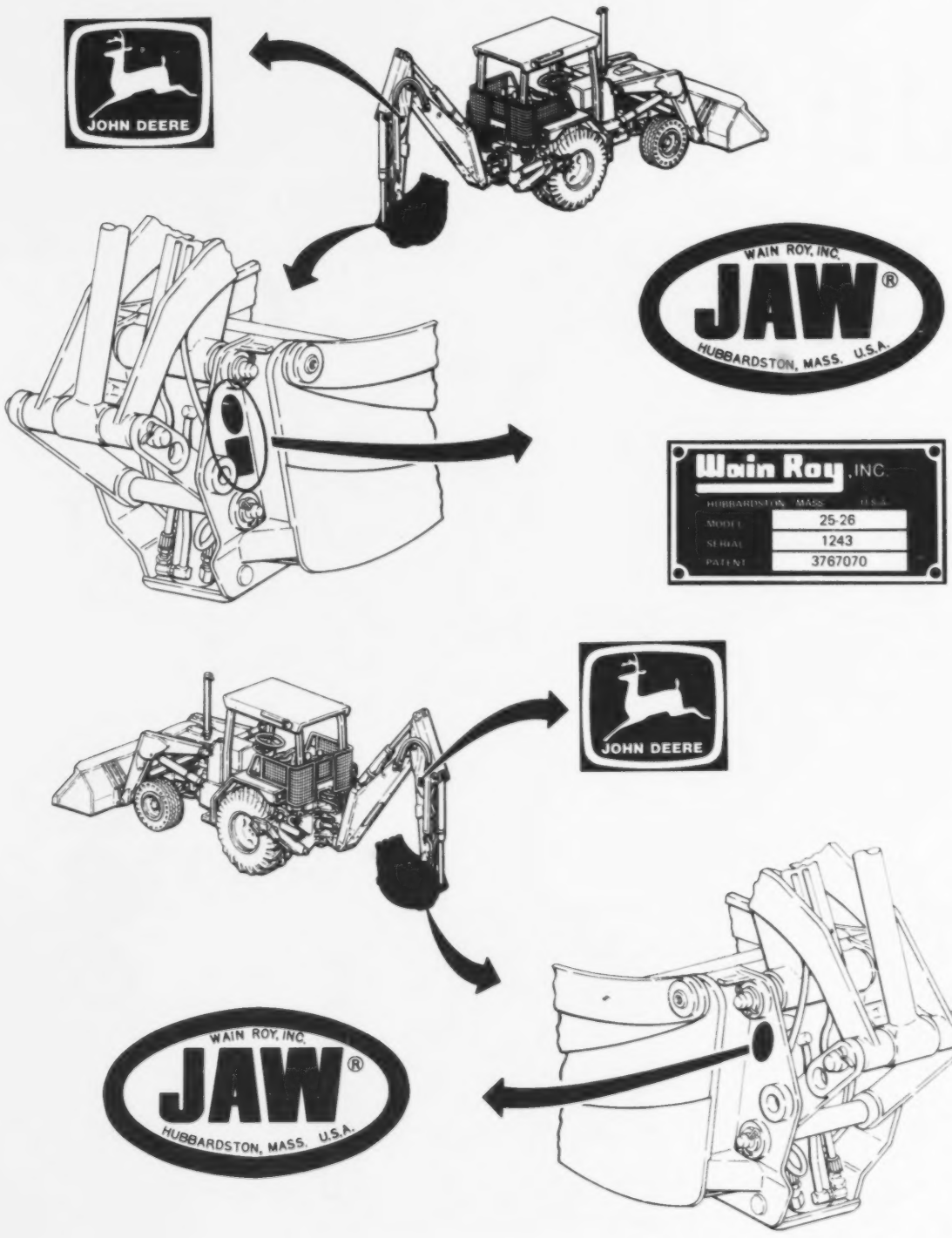
TA234858

EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED



TA234859

EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED



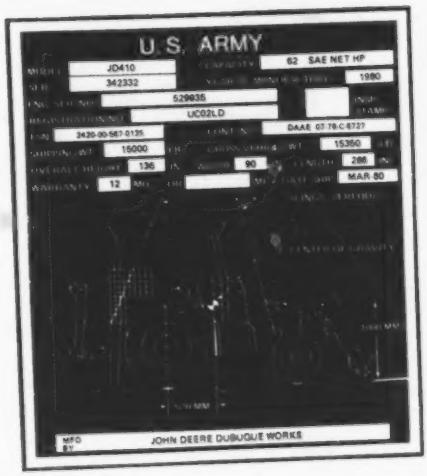
TA234860

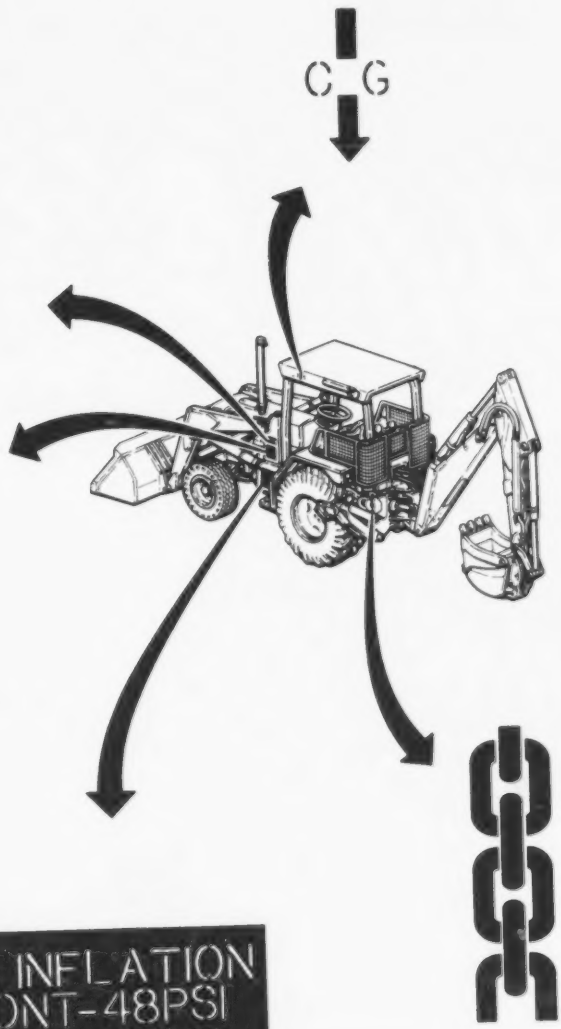
EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED

JD 410

IMPORTANT

Below 0 F, without use of booster batteries or engine coolant heater, use Conoco DN600 "Polar Start" or equivalent which conforms to MIL L 46152. Do not use at temp. above 0 F



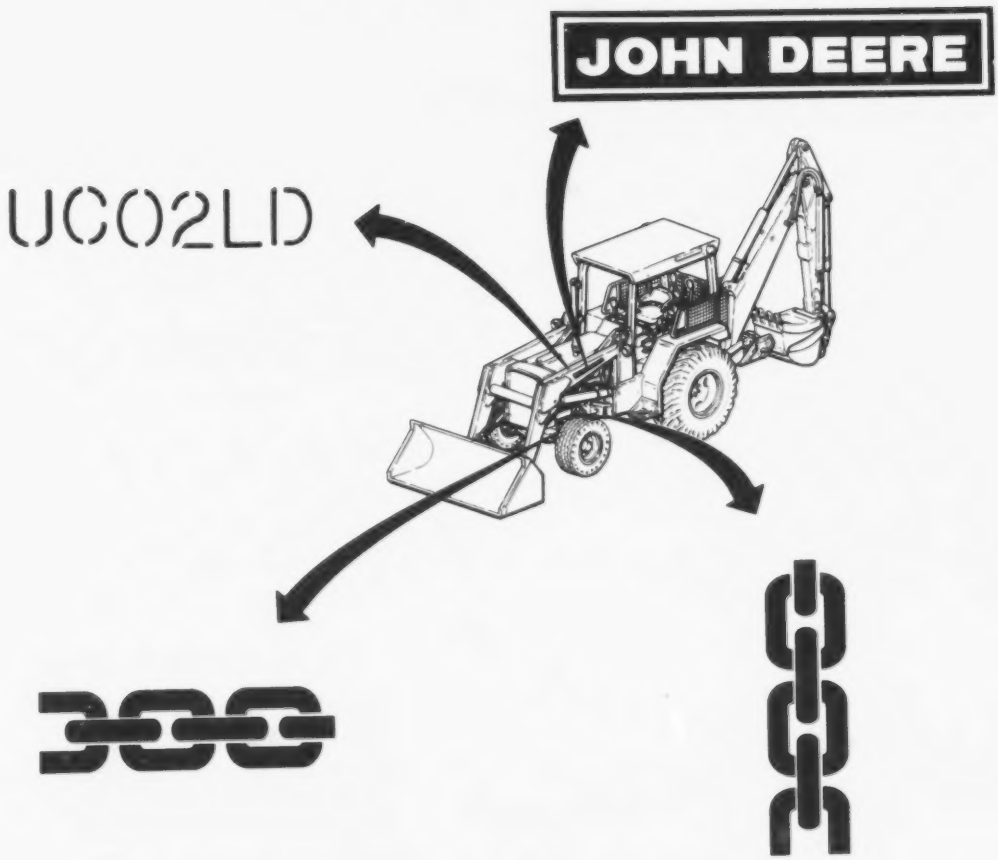


TIRE INFLATION
FRONT-48PSI
REAR-22PSI

OPERATING WT.
15,000 LBS.

TA234861

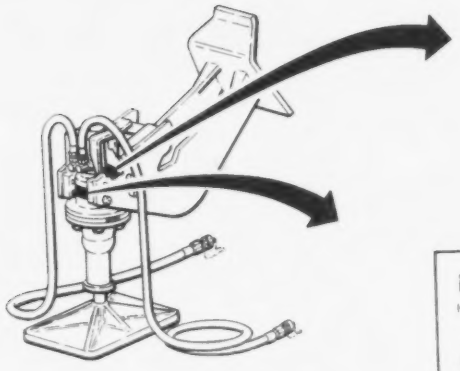
EXTERIOR DATA PLATES, DECALS, AND STENCILS – CONTINUED



TA234862

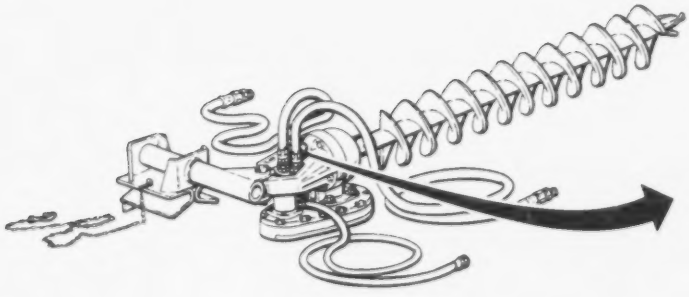
AUXILIARY EQUIPMENT DATA PLATES AND DECALS

These metal data plates and self-adhesive decals are applied to loader backhoe auxiliary equipment. They provide necessary information for operation and maintenance of loader backhoe auxiliary equipment. Auxiliary equipment data plates and decals are located and illustrated below in case wear or other damage has made them difficult to read.



USE HUGHES SPECIAL
IMPACTOR LUBRICANT
ONLY

HUGHES MODEL 1000 IMPACTOR
HUGHES TOOL COMPANY HOUSTON, TEXAS
IMPORTANT
HIGHLY COMPRESSED SPRING INSIDE, USE TRAINED PERSONNEL FOR SERVICE CONSULT DEALERS SERVICE MANUAL FOR PROPER PROCEDURES. THIS HUGHES PRODUCT IS COVERED BY ONE OR MORE OF THE FOLLOWING U.S. PATENTS 3,186,498 – 3,302,732 – 3,411,591 – 3,513,918 – 3,774,700 – 4,082,151 – 4,032,52
BA902



DANUSER DIGGER
MODEL SERIES
H8200-5 2484
DANUSER MACHINE CO
FULTON, MISSOURI

rA234863

Section IV. OPERATION UNDER UNUSUAL CONDITIONS

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STARTING ENGINE IN EXTREME COLD

NOTE

If your loader backhoe is equipped with an engine coolant heater, plug 1000-Watt, 115-Volt engine coolant heater into 115-Volt power supply ten hours before starting.

1. Prepare for operation (page 2-60).

CAUTION

Always allow engine to warm up slowly. Apply all controls carefully so that none are forced.

2. Start engine at temperature under 32°F (0°C (page 2-63).

COOLING SYSTEM MAINTENANCE IN EXTREME COLD

1. Inspect cooling system for leaking hoses and fittings (page 2-10). Have Organizational Maintenance replace leaking parts.
2. Have Organizational Maintenance check cooling system clamps for tightness and tighten if necessary.
3. Have Organizational Maintenance make sure drain plugs are installed.
4. If coolant level is low, add antifreeze solution (page 3-41). If antifreeze is not available, and coolant is only water, have Organizational Maintenance drain cooling system after use. When loader backhoe is to be used again, have Organizational Maintenance install drain plugs and fill cooling system.
5. Operate engine for 15 minutes after operating temperature is reached to mix solution.

LUBRICATION IN EXTREME COLD

1. Always use proper grade of lubricant (LO 5-2420-222-12).
2. Have Organizational Maintenance drain and refill where necessary if grade of lubricant is not correct for cold weather operation (LO 5-2420-222-12).

FUEL SYSTEM MAINTENANCE IN EXTREME COLD

1. To avoid water condensation, completely fill fuel tank after each operating period (page 3-32).
2. Have Organizational Maintenance drain off any water from fuel tank at the end of each day's operation.
3. Drain fuel filter sediment bowls of any water that may have accumulated (page 3-37).

AT HALT OR PARK IN EXTREME COLD

CAUTION

Mud or snow collected on tires during operation may freeze solid while loader backhoe is parked. Tires can freeze to ground. Serious damage can result if you try to break loader backhoe loose under engine power or if large, frozen lumps of mud, ice, or snow become wedged in tires.

1. Park loader backhoe in shelter if possible. If shelter is not available, park in area out of wind.
2. Cover engine with tarpaulins, if available, to protect from snow and ice. Do not tie tarpaulins to ground stakes. Tarpaulins can freeze to ground.
3. Park loader backhoe on planks or brush piles to prevent tires from freezing to ground.
4. Block loader backhoe and backhoe bucket with wooden planks so they will not freeze to the ground.

HYDRAULIC SYSTEM OPERATION IN EXTREME COLD

CAUTION

Before operating loader backhoe in extremely cold temperatures, transmission and hydraulic system oil must be fully circulated to avoid breaking hoses or damaging other parts.

1. With loader backhoe stationary and engine running (page 2-63), slowly turn steering wheel a short distance, first one way and then the other.
2. Gradually increase turn in each direction until full travel of hydraulic cylinder(s) is reached. This will circulate and warm oil in cylinders, lines, and hoses.
3. Operate all other hydraulic controls in similar manner; slowly, a short distance, in alternate directions, increasing distance gradually until full travel of cylinders is reached.

COOLING SYSTEM MAINTENANCE IN EXTREME HEAT

1. Keep a constant watch on coolant level (page 3-41).
2. Keep a constant watch on ENGINE WATER TEMP. gage. If coolant gets too hot, shut down engine (page 2-67), and find cause of overheating.
3. Have Organizational Maintenance remove all obstructions and debris from radiator fins and air passages.

LUBRICATION IN EXTREME HEAT

1. Make sure air cleaner is open and free of dirt (pages 2-32 and 2-35).
2. Lubricate loader backhoe with proper grade of lubricants for hot weather (LO 5-2420-222-12).

FUEL SYSTEM MAINTENANCE IN EXTREME HEAT

1. Make sure fuel tank and sediment bowl is clean (page 3-37).
2. Have Organizational Maintenance make sure fuel filters are clean.
3. Keep fuel tank full. Add fuel as necessary (page 3-32).
4. Have Organizational Maintenance change fuel filters as needed.

GENERAL MAINTENANCE IN SAND AND DUST

Operation in sand and dust can be hazardous to the loader backhoe. Sand and dust are abrasives and can quickly cause wear on many parts of the vehicle.

COOLING SYSTEM MAINTENANCE IN SAND AND DUST

1. Keep watch on coolant level (page 3-41).
2. Have Organizational Maintenance check for clogged radiator, and flush cooling system frequently.

LUBRICATION IN SAND AND DUST

1. Have Organizational Maintenance change filters frequently.
2. Lubricate with proper grade of lubricant (LO 5-2420-222-12).

AIR CLEANER MAINTENANCE IN SAND AND DUST

Watch AIR CLEANER INDICATOR and service air cleaner as necessary (page 3-25).

FUEL SYSTEM MAINTENANCE IN SAND AND DUST

1. Check for leaks.
2. Have Organizational Maintenance change fuel filter as needed.

ELECTRICAL SYSTEM MAINTENANCE IN SAND AND DUST

Keep sand and dust off harnesses and connections in electrical and ignition system.

TRANSMISSION AND HYDRAULIC SYSTEM MAINTENANCE IN SAND AND DUST

1. Have Organizational Maintenance clean or replace filters often, to keep system free of sand and dust. Sand and dust will damage seals and valves and cause transmission and hydraulic system leaks and failures.
2. Refer to Lubrication Order (LO 5-2420-222-12) for proper grade of hydraulic, transmission fluid.

LUBRICATION IN DEEP MUD OR WATER

Have Organizational Maintenance check for dirt and water in transmission fluid. Have Organizational Maintenance Change oil frequently in transmission. Water or mud found in transmission and final drives is an indication of faulty seals. Notify Direct Support Maintenance.

FUEL SYSTEM MAINTENANCE IN RAINY OR HUMID CONDITIONS

1. Keep fuel tanks full at all times (page 3-32).
2. Make sure fuel tank cap is tight (page 3-30).

LUBRICATION IN RAINY OR HUMID CONDITIONS

Keep all moving parts well lubricated (LO 5-2420-222-12).

ELECTRICAL SYSTEM MAINTENANCE IN RAINY OR HUMID CONDITIONS

1. Wipe all moisture from electrical harnesses and connections.
2. If moisture begins to build up under instrument panel gages, notify Direct Support Maintenance.

GENERAL MAINTENANCE IN SALT WATER AREAS

Salt water is very hard on metal surfaces and quickly causes rust. Keep loader backhoe as clean as possible. After operation, wash with clean water, if available.

ELECTRICAL SYSTEM MAINTENANCE IN SALT WATER AREAS

Keep all wiring and ignition terminals free from rust.

LUBRICATION IN SALT WATER AREAS

Keep all lubricating points clean and well lubricated (LO 5-2420-222-12).

OPERATION IN HIGH ALTITUDES

1. Governor and high idle settings have been established to allow engine to be operated at a specific altitude.
2. Engine can be operated at higher altitudes without changing adjustments, but engine performance will be less.

NUCLEAR, BIOLOGICAL, OR CHEMICAL EXPOSURE

For information on nuclear, biological, or chemical exposure refer to TM 3-220.

CHAPTER 3

MAINTENANCE INSTRUCTIONS

OVERVIEW

This chapter contains detailed maintenance procedures that operator may perform to maintain loader backhoe.

		Page
Section I.	Lubrication Instructions	3-1
Section II.	Operator Troubleshooting	3-4
Section III.	General Maintenance Instructions	3-15
Section IV.	Engine	3-20
Section V.	Fuel System	3-24
Section VI.	Cooling System	3-41
Section VII.	Electrical System	3-45
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Section IX.	Wheels and Tracks	3-58
Section X.	Body, Cab, Hood, and Hull	3-60
Section XI.	Fire Fighting Equipment Components	3-69
Section XII.	Parts Peculiar	3-72

Section I. LUBRICATION INSTRUCTIONS

	Page		Page
General	3-1	Oil Can Lubrication Points	3-3
Grease Gun Lubrication Points	3-1		

GENERAL

This section contains general information for lubrication of loader backhoe.

GREASE GUN LUBRICATION POINTS

This task covers:

Lubrication (page 3-2)

INITIAL SETUP

Tools

Adapter grease gun, coupling, flex
Adapter grease gun, coupling, rigid
Gun, lubricating, hand, 14-oz

Materials/Parts

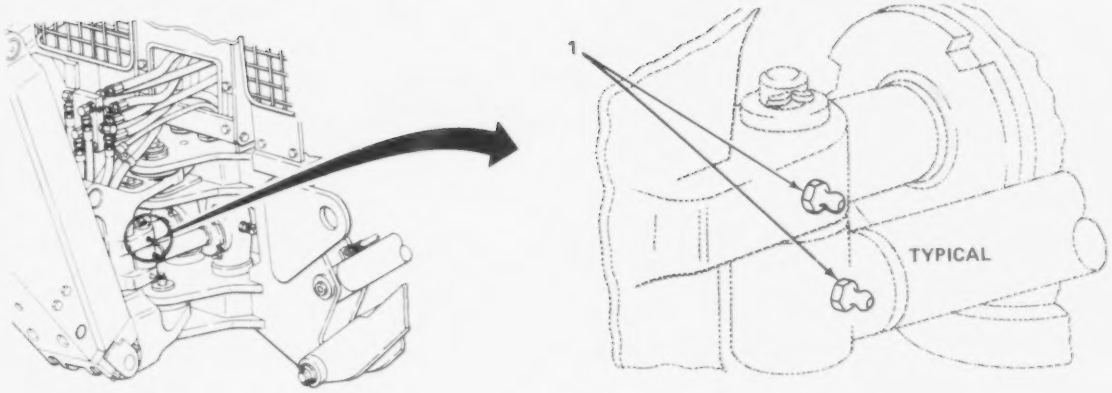
Grease, GAA (item 5, appendix D)
Rags, wiping (item 7, appendix D)

Personnel Required

One

GREASE GUN LUBRICATION POINTS – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
LUBRICATION		
	NOTE There are many grease gun lubrication points on this vehicle. This procedure covers one typical grease gun lubrication point. For location and number of grease gun lubrication points, see LO 5-2420-222-12.	
	Grease fitting (1)	a. If grease fitting (1) and area around it is dirty, wipe clean, using clean, dry rag. b. Push grease gun adapter onto grease fitting (1). c. Lubricate in accordance with LO 5-2420-222-12. d. Pull off grease gun adapter. e. Using clean, dry rag, clean excess grease from fitting (1).



TASK ENDS HERE

TA234912

OIL CAN LUBRICATION POINTS

This task covers:

Lubrication (page 3-3)

INITIAL SETUP

Tools

Oiler, hand, 6-oz
(Organizational Maintenance)

Materials/Parts

Oil, engine (item 6, appendix D)
Rags, wiping (item 7, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION **REMARKS**

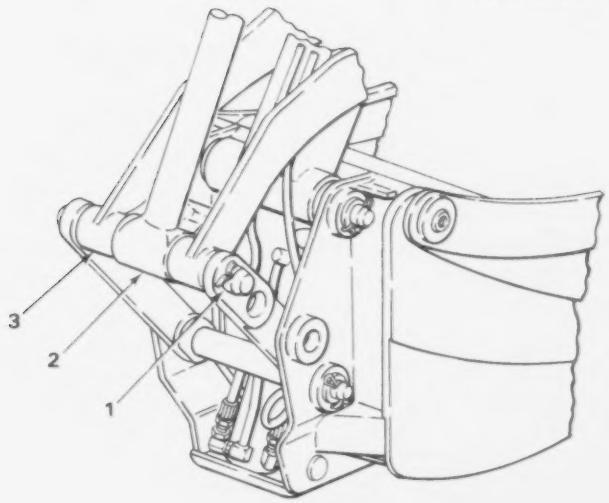
LUBRICATION

NOTE

There are many oil can lubrication points on this vehicle. This procedure covers one typical oil can lubrication point. For location and number of oil can lubrication points, see LO 5-2420-222-12.

Retaining pin (1)

a. Using clean, dry rag, clean dipperstick area around retaining pin (1).
b. Using hand oiler, apply oil through openings between backhoe bucket cylinder rod (2) and bucket (3).
c. Using clean, dry rag, remove excess oil from bucket (3).



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Section II. OPERATOR TROUBLESHOOTING

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Introduction	3-4
Symptom Index	3-4
Troubleshooting	3-4
Troubleshooting Table	3-5

INTRODUCTION

This section contains troubleshooting procedures that the operator can use to find and fix malfunctions which may occur while loader backhoe is being operated or maintained. If problem cannot be found and corrected by the operator using these procedures, notify Organizational Maintenance.

TROUBLESHOOTING

Troubleshooting Table lists common malfunctions which you may find during operation or maintenance of loader backhoe or its components. You should perform tests/inspections and corrective actions in the order listed.

This manual cannot list all malfunctions that may occur, nor all the tests or inspections and corrective actions. If a malfunction is not listed or is not corrected by listed corrective action, notify your supervisor.

EXPLANATION OF COLUMNS

MALFUNCTION	Visual or operational indication that something is wrong with loader backhoe.
TEST/INSPECTION	Procedure to isolate problem to a component or system.
CORRECTIVE ACTION	Procedure to correct problem.

SYMPTOM INDEX

This symptom index is provided as a quick way to get you to the part of the troubleshooting table that will help you solve the problem. It lists all malfunctions covered in Troubleshooting Table.

To use symptom index, find the problem that you have with loader backhoe in the index. Go to page indicated for troubleshooting procedures to help you find and correct the problem.

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ENGINE	
Engine coolant temperature too high	3-9
Engine cranks but fails to start, or is hard to start	3-7
Engine fails to crank when starter is engaged	3-5
Engine knocks	3-8
Engine lacks power	3-10

SYMPTOM INDEX – CONTINUED

ENGINE – CONTINUED

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Engine oil pressure low	3-8
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Exhaust is black or gray	3-9
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HYDRAULIC SYSTEM

Hydraulics function slowly	3-12
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Low or no hydraulic pressure	3-12

STEERING SYSTEM

Loader backhoe hard to steer	3-14

TROUBLESHOOTING TABLE

The following table provides procedures that operator can use to find and fix loader backhoe malfunctions.

OPERATOR TROUBLESHOOTING

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
ENGINE
1. ENGINE FAILS TO CRANK WHEN STARTER IS ENGAGED
Step 1. Check batteries electrolyte level (page 3-49).
If electrolyte level is low, service battery (page 3-49).

OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE – CONTINUED

1. ENGINE FAILS TO CRANK WHEN STARTER IS ENGAGED – CONTINUED

Step 2. Check battery terminal posts, terminal lugs, and cables for dirt, corrosion, looseness, and breakage (pages 3-49 and 3-51).

a. If dirty or corroded, clean (page 3-51).

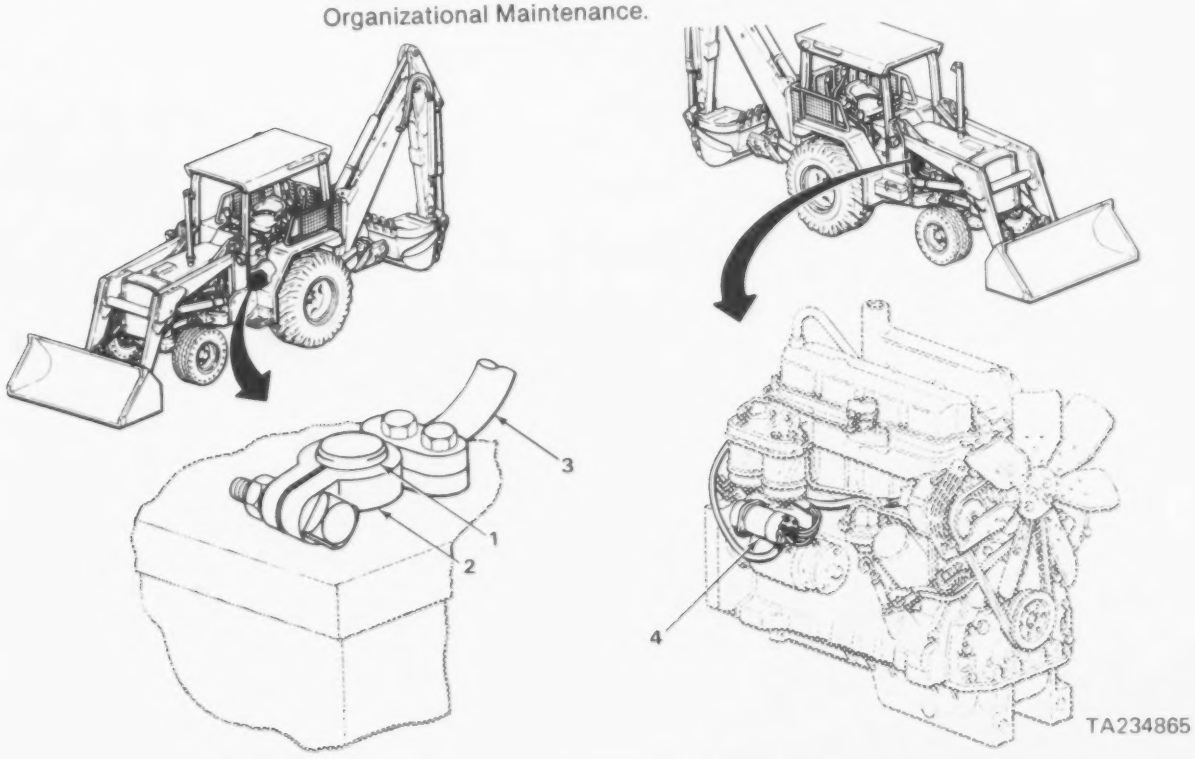
b. If terminal lugs or cables are loose, tighten (page 3-49).

c. If broken or damaged battery terminal posts (1), terminal lugs (2), or cables (3) are found, notify Organizational Maintenance.

d. If engine still fails to crank when starter is engaged, notify Organizational Maintenance.

Step 3. Check for loose or corroded connections at starter solenoid (4).

If loose or corroded connections are found, notify Organizational Maintenance.



OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

ENGINE – CONTINUED

2. ENGINE CRANKS BUT FAILS TO START OR IS HARD TO START

Step 1. Check fuel level.

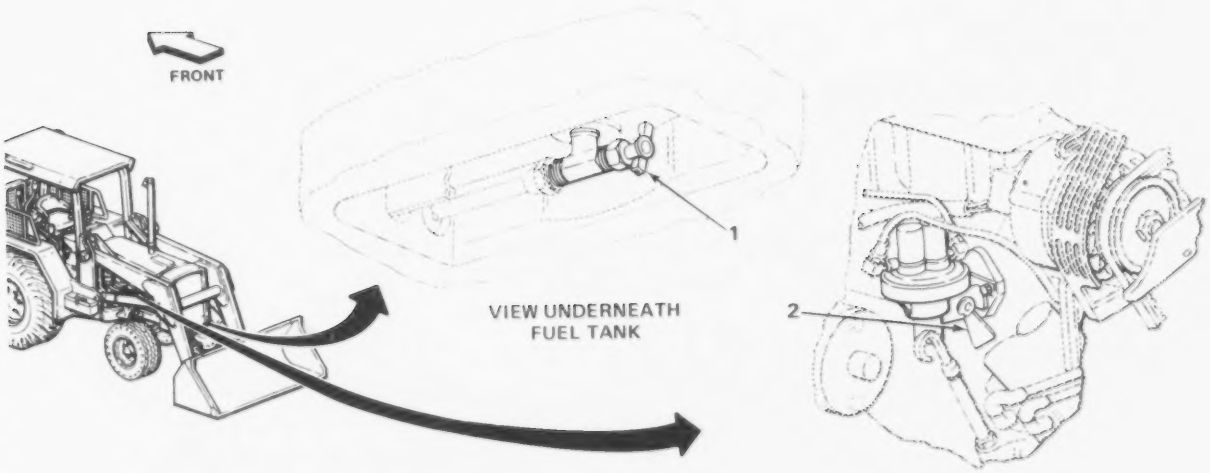
If fuel tank is empty, service (page 3-32).

Step 2. Check to see that fuel shutoff valve (1) under fuel tank is open.

If fuel shutoff valve (1) is closed, turn counterclockwise to open.

Step 3. Check to see that primer lever (2) is closed (toward engine).

If primer lever (2) is not closed (toward engine), prime transfer pump by moving lever in and out several times and leaving in closed position (toward engine).



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OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE – CONTINUED

2. ENGINE CRANKS BUT FAILS TO START OR IS HARD TO START – CONTINUED

Step 4. Check to see if fuel shutoff wire (1) is connected or broken.

If wire (1) is broken or disconnected, notify Organizational Maintenance.

Step 5. Check to see that correct starting procedure for surrounding air temperature is being used.

a. If surrounding air temperature is abcve 32°F (0°C), use starting procedure under usual conditions (page 2-61).

b. If surrounding air temperature is below 32°F (0°C), use cold weather starting procedure under unusual conditions (page 2-135).

Step 6. Check to see if sediment bowl and filter are plugged (page 2-37).

a. If sediment bowl or filter are plugged, drain (page 3-37).

b. If engine still fails to start or is hard to start, notify Organizational Maintenance.

3. ENGINE KNOCKS

Check engine oil level (page 2-40).

a. If engine oil level is not at proper level, service (page 2-40 and LO 5-2420-222-12).

b. If engine oil level is at proper level and engine still knocks, notify Organizational Maintenance.

4. ENGINE OIL PRESSURE LOW

Check engine oil level (page 2-40).

a. If engine oil level is not at proper level, service (page 2-40 and LO 5-2420-222-12).

b. If engine oil pressure is still low, notify Organizational Maintenance.

OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE – CONTINUED

5. ENGINE COOLANT TEMPERATURE TOO HIGH

Check engine coolant level (page 2-41).

a. If engine coolant level is low, fill (page 3-41).

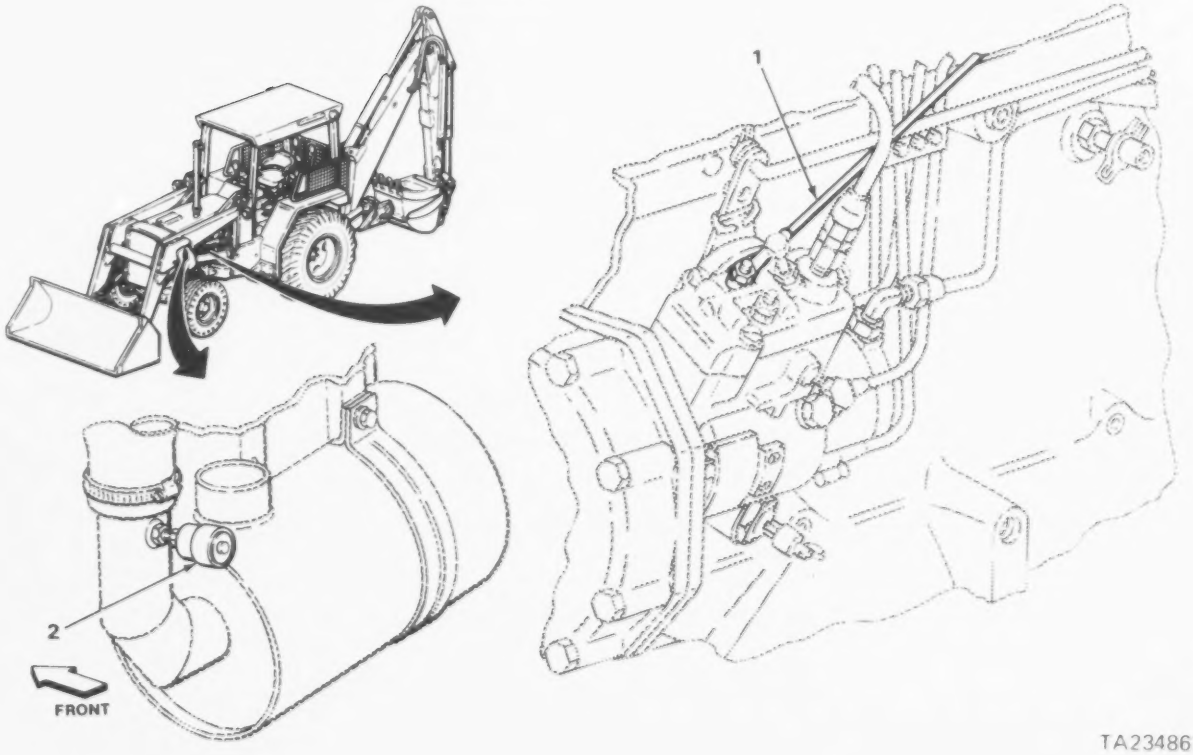
b. If engine coolant level is correct, notify Organizational Maintenance.

6. EXHAUST IS BLACK OR GRAY

Check air restriction indicator (2).

a. If air restriction indicator is red, service air cleaner element (page 3-25).

b. If air restriction indicator is green, notify Organizational Maintenance.



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OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

ENGINE – CONTINUED

7. EXHAUST IS WHITE

Check that engine is properly warmed up (page 2-66).

a. Warm up engine by operating at half-throttle for five minutes (page 2-66).

b. If exhaust is still white after engine warmup, notify Organizational Maintenance.

8. ENGINE USES TOO MUCH OIL

Check for oil leaks.

a. Check for leaks in lines (1), around oil pan (2), dipstick nipple (3), filler cap (4), and at drainplug (5).

b. If engine still uses too much oil, notify Organizational Maintenance.

9. ENGINE USES TOO MUCH FUEL

Step 1. Check for leaks in lines (6), nozzles (7), pump (8), fuel sediment bowl and filter (9).

If leaks are found, notify Organizational Maintenance.

Step 2. Service air cleaner element (page 3-25).

10. ENGINE LACKS POWER

Step 1. Check air restriction indicator (10).

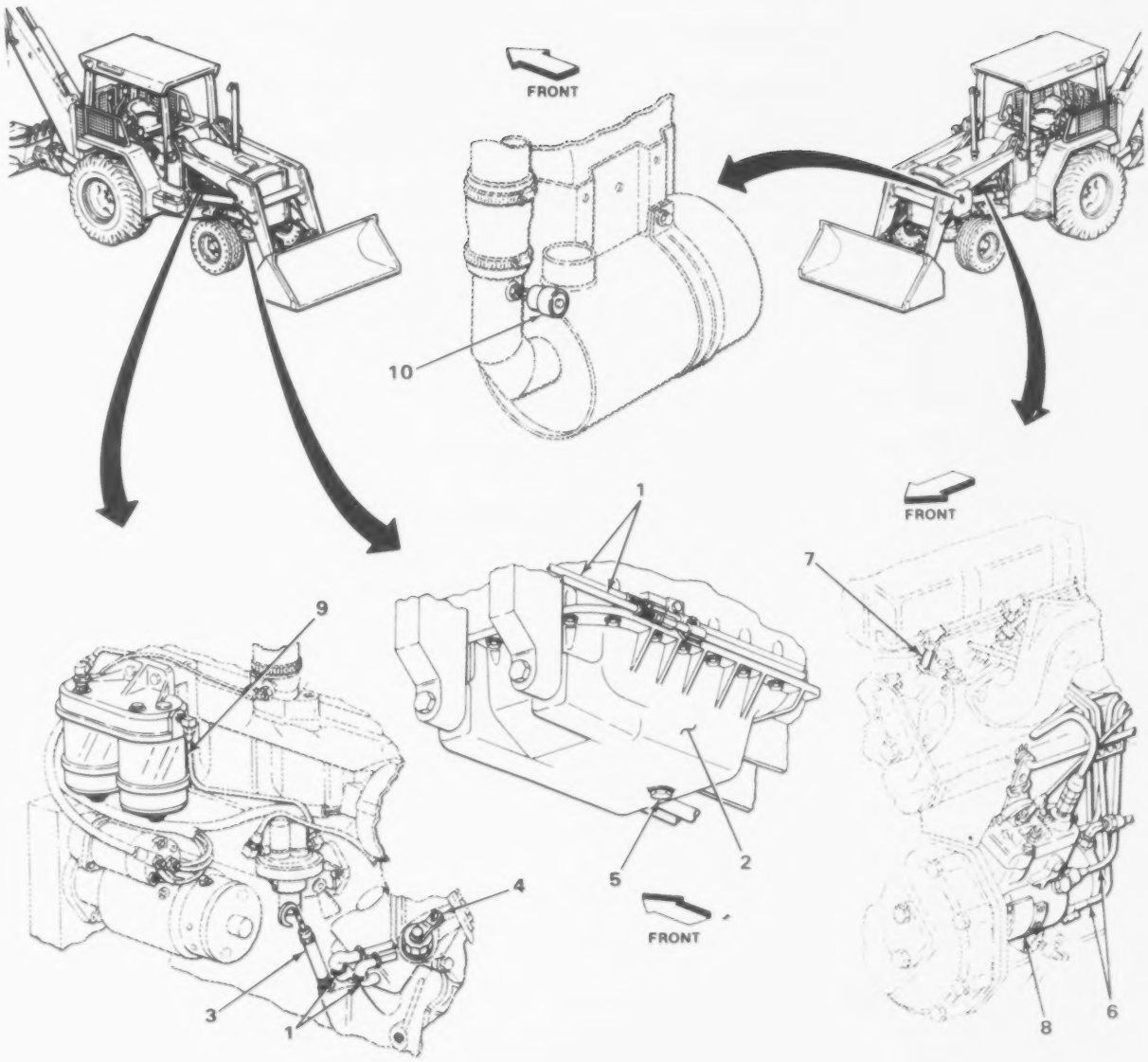
a. If air restriction indicator is red, service air cleaner element (page 3-25).

b. If air restriction indicator is green, notify Organizational Maintenance.

c. If engine still lacks power, notify Organizational Maintenance.

OPERATOR TROUBLESHOOTING – CONTINUED

ENGINE – CONTINUED



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OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC SYSTEM

1. HYDRAULICS FUNCTION SLOWLY

Step 1. Cold hydraulic oil

Let engine warm up to proper operating temperature (page 2-66).

Step 2. Check tachometer (1) and note engine speed.

a. If engine speed is too slow or too fast adjust (page 2-92).

b. If engine speed is correct and hydraulics still function slowly, notify Organizational Maintenance.

2. HYDRAULIC OIL TEMPERATURE TOO HIGH

Step 1. Check for dents or restrictions in oil hoses (2) and lines (3).

If dents or restrictions are found, notify Organizational Maintenance.

Step 2. Check if speed gear assembly (reverser) lever (4) is in neutral position.

a. If speed gear assembly (reverser) lever (4) is not in neutral position, move to neutral position.

b. If speed gear assembly (reverser) lever (4) is in neutral position and hydraulic oil temperature is still too high, notify Organizational Maintenance.

3. LOW OR NO HYDRAULIC PRESSURE

Step 1. Check for leaks at cylinder packings (page 2-10).

If packings leak, notify Organizational Maintenance.

Step 2. Check for low or no oil in system.

a. If low or no oil found, service transmission (page 3-54 and LO 5-2420-222-12).

b. If there is still low or no hydraulic pressure, notify Organizational Maintenance.

OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

HYDRAULIC SYSTEM – CONTINUED

4. HYDRAULIC OIL FOAMS

Step 1. Check for low oil (page 2-48).

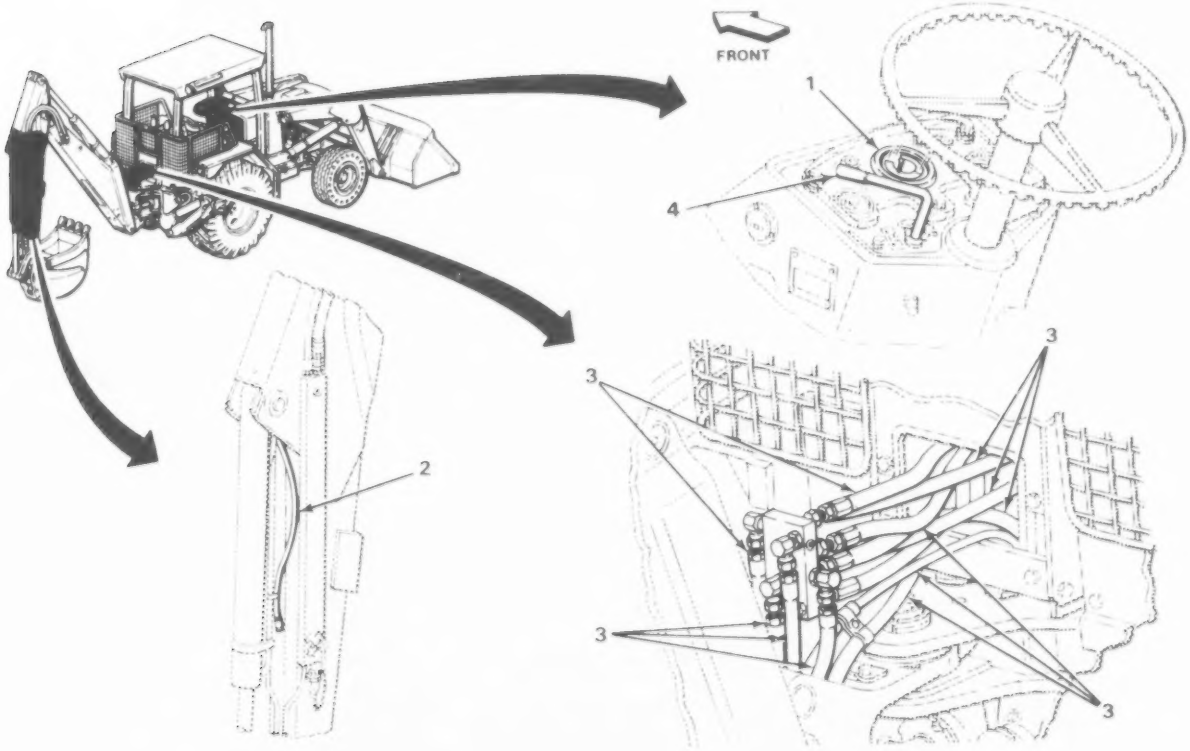
If oil level is low, service transmission (page 3-54).

Step 2. Check for kinks in hoses (2) and lines (3).

If kinks are found, notify Organizational Maintenance.

Step 3. Check for presence of water on dipstick (page 3-54).

If water is found, notify Organizational Maintenance.



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OPERATOR TROUBLESHOOTING – CONTINUED

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

STEERING SYSTEM

LOADER BACKHOE HARD TO STEER

Step 1. Check to see if hydraulic steering cylinder (1) is leaking.

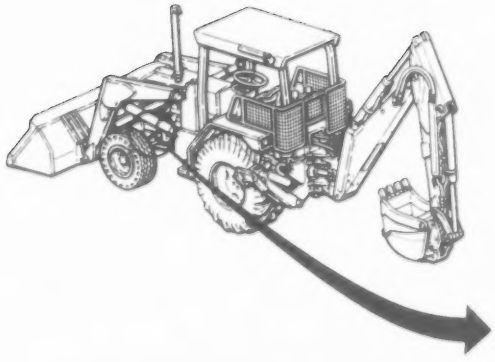
If cylinder is leaking, notify Organizational Maintenance.

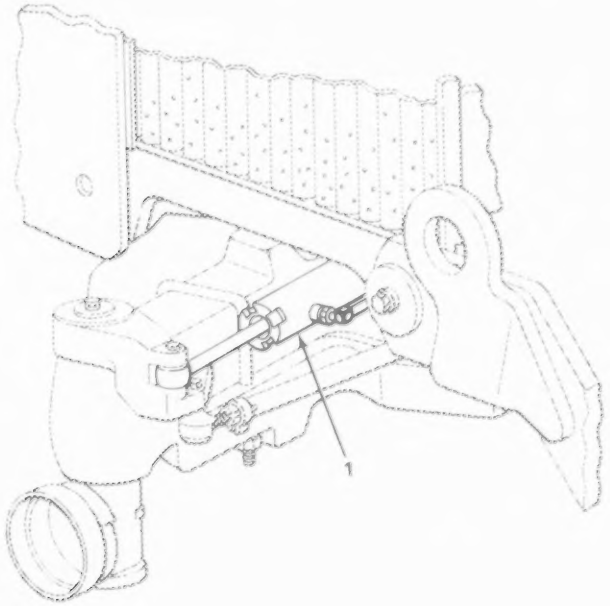
Step 2. Check for improper tire inflation (page 2-16).

a. If tire air pressure is too high, adjust to correct pressure for operating conditions (page 3-58).

b. If tire air pressure is too low, see page 3-58.

c. If loader backhoe is still hard to steer, notify Organizational Maintenance.





WHEEL REMOVED FOR CLARITY

TA234870

Section III. GENERAL MAINTENANCE INSTRUCTIONS

	Page		Page
Cleaning Procedures	3-15	Inspection Guidelines	3-19
General Information	3-15		

GENERAL INFORMATION

CAUTION

If at any time during operation or maintenance you notice or suspect defects in parts normally checked or replaced by higher level of maintenance, notify that level of maintenance. Do not operate equipment with or install parts suspected of defects that could cause damage to other parts.

This section contains maintenance practices that apply to all maintenance tasks in this chapter. It contains detailed procedures for cleaning and inspecting parts. It will help you to thoroughly read all these instructions, since familiarity with these instructions will cut down on maintenance time in the future.

CLEANING PROCEDURES

The reason for cleaning each part is to make sure that each part can be inspected properly. Dirt and grease can hide defects and damage on parts, make installation more difficult, and prevent parts from being fastened tightly. Parts that are cleaned carelessly or improperly can be damaged. It is very important that you pay attention to what kinds of materials make up a part of assembly.

METAL PARTS

Use the following procedures for removing dirt, grease, and oil from parts that are all metal:

1. Lower part or parts into a solution of hot soapy water. If item is small, place into a wire mesh basket and lower into soap solution. Let part soak for three minutes before removing.

2. Take part or parts out of soap solution, and rinse in clean, warm water.

CAUTION

Stiff wire brushes and scraping tools can scratch and gouge machined surfaces. Do not use these kinds of tools to clean dirt and grime from machined surfaces.

3. Use stiff bristle brush or scraper to clean hard to get at areas. Pay special attention to cleaning around moving parts.

CLEANING PROCEDURES – CONTINUED

METAL PARTS – CONTINUED

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

4. Use a clean rag dampened with drycleaning solvent to wipe off any grime the soap solution did not take off. If necessary, use vapor degreaser, and let part soak in solvent for two or three minutes.

5. Dip part again in soap and water solution for one minute, and rinse in clean water.

6. Wipe dry with clean, dry rags.

7. Repeat any combination of steps listed above if dirt or grease remains on part.

PLASTIC AND RUBBER PARTS

Use the following steps to remove grease, dirt, and oil from parts made from plastic or rubber:

CAUTION

Do not use wire brush or scraper on plastic or rubber surfaces. Do not use petroleum based solvents on rubber or plastic. Solvents can ruin plastic or rubber parts.

1. Immerse parts in warm, soapy water. If parts are small, put them in wire mesh basket and lower into soapy solution. Let parts soak for three to five minutes.

2. Take parts out of soapy solution, and scrub with stiff bristle brush.

3. Rinse parts in clean water.

4. Wipe dry parts with clean, dry rags. Use compressed air to remove water from hard to get at parts.

5. Repeat any combination of steps listed above if dirt or grime still remains on parts.

CLEANING PROCEDURES – CONTINUED

PARTS HAVING METAL, PLASTIC, AND RUBBER MATERIAL

CAUTION

Do not use wire brush or scraper on plastic surfaces or rubber surfaces. Never clean plastic or rubber parts with petroleum based solvents. Solvents can ruin rubber and plastic parts.

1. Immerse part or parts into warm, soapy solution. If parts are small, put them in wire mesh basket. Let parts soak for three to five minutes.
2. Take parts out of soapy solution, and scrub with stiff bristle brush.
3. Rinse parts in clean, warm water.

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

NOTE

When cleaning metal with solvent or vapor degreaser, protect all plastic and rubber parts by shielding them with a greaseproof barrier material.

4. Dampen clean rag in drycleaning solvent and wipe off stubborn grease and dirt from metal surfaces, or use vapor degreaser, and allow parts to soak for two or three minutes.
5. Put parts in soapy solution, and allow to soak for two to three minutes.
6. Wipe dry with clean, dry rags.
7. Repeat any combination of steps listed if dirt still remains on parts.

RUST AND CORROSION

1. Take off rust spots from metal surfaces with sand paper or grade 3 steel wool. Do not use anything more abrasive than crocus cloth to take rust off machined surfaces.

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CLEANING PROCEDURES – CONTINUED

RUST AND CORROSION – CONTINUED

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

2. Clean sanded area with drycleaning solvent, and finish cleaning part, if necessary, by one of the above methods. If sanded area was painted, paint sanded area. If sanded area was not painted, apply thin coating of clean oil.

PAINTING

Refer to TM 43-0139 and AR 750-58 for painting procedures. Refer to TC 5-200 for camouflage instructions.

FILTERS

NOTE

Alway remove dirt from filters by forcing dirt outward. Direct air pressure from inside to outside of filter.

1. Tap filter lightly against hand several times to help loosen dirt.
2. Thoroughly clean filter with compressed air.
3. Use clean rag to wipe dirt off metal surfaces.

WARNING

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4. Use clean rag dampened with drycleaning solvent to wipe off stubborn dirt and grease from metal surfaces. Wipe dry with clean, dry rags.

INSPECTION GUIDELINES

Inspection at operator level consists of several visual checks. The reason for parts inspection is to determine if parts can be used again or if they need to be replaced.

When performing a visual inspection, pay particular attention to areas that are threaded, torqued, under pressure, subject to heavy loads, or exposed to heat, cold, and weather conditions. Don't be timid during inspection. Pull, push, or bend flexible parts in order to discover defects or damage that may be hidden at first glance.

THREADED PARTS

Look for crossed, cracked, flattened, or stripped threads. Look for pitting, rusting, chipping, flaking, and cracking metal. Notify Organizational Maintenance if screws and nuts cannot be removed or when metal deterioration exists.

HOSES AND LINES

Look for broken or frayed material on hoses. Check hoses and lines for kinks and flat areas. Look for signs of wear on lines and hoses when they may have rubbed against metal. Look at hose connections for swelling. Check hose for softness by squeezing. Nofity your supervisor if hoses are unusually soft. Look for stains. Stains indicate a leak in hoses or lines.

WELDMENTS AND CASTINGS

Look at weldments for loose or chipped paint, rust, gaps, holes, or cracks where parts join together. Look at castings for cracks, breaks, pitting, and abrasive wear caused by vibration. Check for cracks around bolt holes.

RUBBER

Look for tears, breaks, cracks, swelling, and excessive wear. If damage is found, notify your supervisor.

Section IV. ENGINE

	Page		Page
Oil Filler Cap	3-20	Oil Level Gage	3-22

OIL FILLER CAP

This task covers:

a. Removal (page 3-20)
b. Cleaning (page 3-20)
c. Inspection/Replacement (page 3-21)
d. Installation (page 3-21)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning
(item 9, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS

REMOVAL

1.	Cap (1) and oil filler neck (2)	Locking latch (3)	Pull out and move aside.
2.	Oil filler neck (2)	Cap (1)	Unscrew and take off.

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

WARNING

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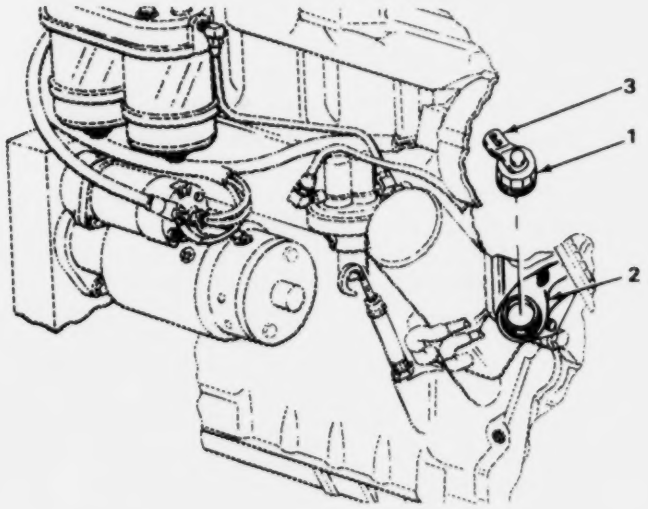
OIL FILLER CAP – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
CLEANING – CONTINUED		
3.	Cap (1)	a. Using clean rags dampened in dry-cleaning solvent, wipe clean. b. Using clean, dry rags, wipe dry.
INSPECTION/REPLACEMENT		
	NOTE For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15). If cap is found defective, notify Organizational Maintenance.	
4.	Cap (1)	Look for cracks, breaks, dents, and damaged threads.
INSTALLATION		
5. Oil filler neck (2)	Cap (1)	Screw on and tighten.
6. Cap (1) and oil filler neck (2)	Locking latch (3)	Place in position and push in.



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OIL LEVEL GAGE

This task covers:

a. Removal (page 3-22)
b. Cleaning (page 3-23)
c. Inspection/Replacement (page 3-24)
d. Installation (page 3-24)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning (item 9, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION / REMARKS
REMOVAL		
1. Dipstick nipple (1)	Liquid level gage (2)	a. Pull out. b. Using clean, dry rag, wipe off oil. c. Place back in position. **Be sure gage is fully seated in dipstick nipple.** d. Pull out, read oil level. **Oil reading on gage indicates amount of oil in engine.**
	NOTE	
	If engine oil level is correct, skip steps 2 thru 5. If engine oil level is too high, go to step 8 and notify Organizational Maintenance.	
2. Oil filler neck (3) and cap (4)	Locking latch (5)	Pull off and move aside.
3. Oil filler neck (3)	Cap (4)	a. Unscrew and take off. b. Add oil (refer to LO 5-2420-222-12). c. Using clean, dry rags, wipe up any excess oil that may have spilled. d. Screw on and tighten.
4. Oil filler neck (3) and cap (4)	Locking latch (5)	Place in position and push on.
5. Dipsitck nipple (1)	Liquid level gage (2)	a. Place in position. **Be sure gage is fully seated in dipstick nipple.**

OIL LEVEL GAGE – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
REMOVAL – CONTINUED		
5.Continued		b. Repeat step 1 to assure oil is at proper level.
CLEANING		

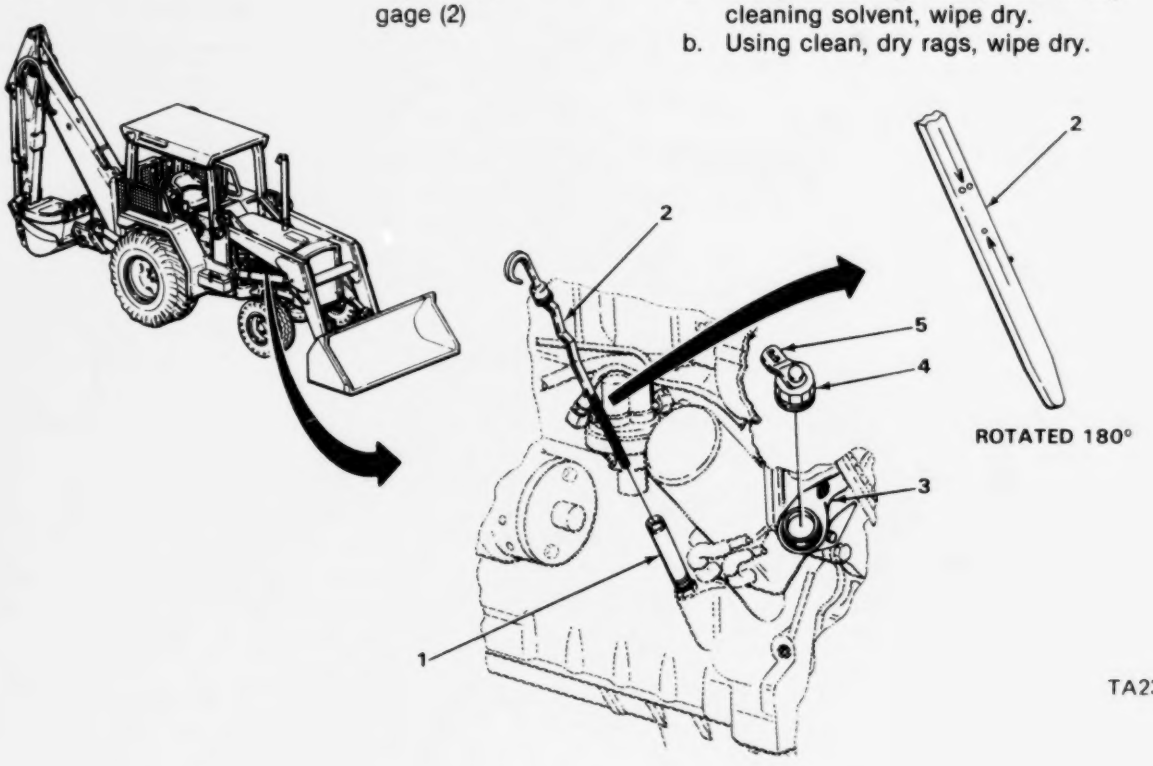
NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

6.	Liquid level gage (2)	a. Using clean rags dampened in dry-cleaning solvent, wipe dry. b. Using clean, dry rags, wipe dry.



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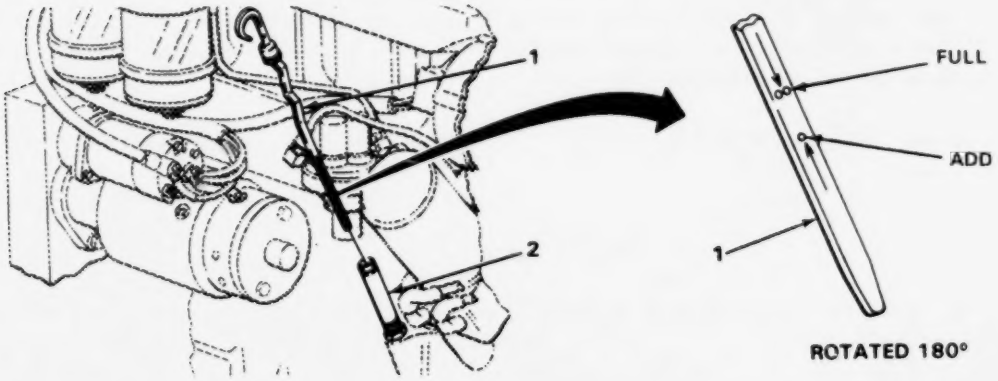
OIL LEVEL GAGE – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
INSPECTION/REPLACEMENT		
	NOTE	
	For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).	
	If defective parts are found, notify Organizational Maintenance.	
7.	Liquid level gage (1)	Look for cracks, breaks, and bends.
INSTALLATION		
8. Dipstick nipple (2)	Liquid level gage (1)	Place in postion. **Be sure gage is fully seated in dipstick nipple.**



TASK ENDS HERE

Section V. FUEL SYSTEM

	Page		Page
Air Cleaner Element	3-25	Fuel Filter Sediment Bowl Plugs	3-35
Engine Primer Fluid	3-39	Fuel Tank	3-32
Fuel Cap	3-30	Fuel Shutoff Valve	3-34
Fuel Filter Sediment Bowl	3-37		

TA234873

AIR CLEANER ELEMENT

This task covers:

a. Removal (page 3-25)
b. Cleaning (page 3-26)
c. Inspection/Replacement (page 3-28)
d. Installation (page 3-28)

INITIAL SETUP

Tools

Compressor, reciprocating air (Organizational Maintenance)
Gun, air blow (Organizational Maintenance)
Hose, air compressor (Organizational Maintenance)
Support, bucket (special tool, (Organizational Maintenance)

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning (item 9, appendix D)

Personnel Required

One

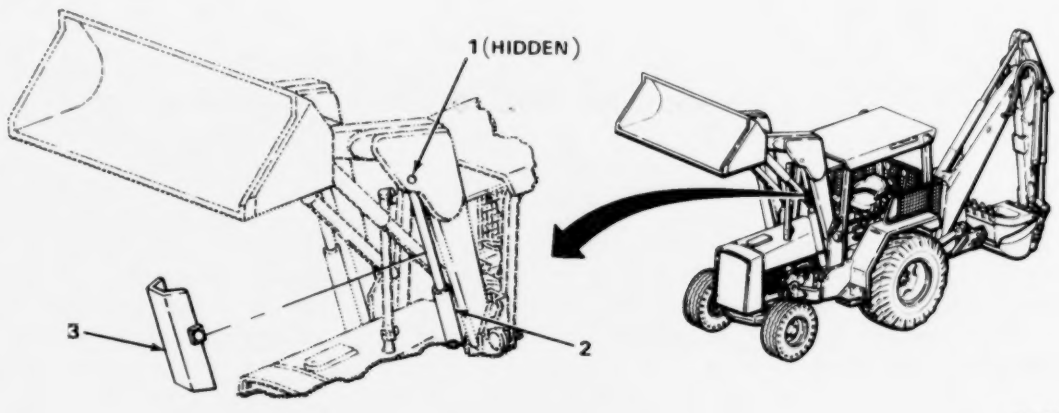
Equipment Condition

Loader bucket raised (page 2-83).
Right side grille removed (page 3-60).

LOCATION	ITEM	ACTION / REMARKS

REMOVAL

1.	Bucket cylinder rod end (1) and cylinder barrel (2)	Bucket support (3)	Place in position.



TA234874

AIR CLEANER ELEMENT – CONTINUED

LOCATION	ITEM	ACTION / REMARKS

REMOVAL – CONTINUED

WARNING

NUCLEAR, BIOLOGICAL, OR CHEMICAL EXPOSURE

After Nuclear, Biological, or Chemical (NBC) exposure of this vehicle, all air filters shall be handled with extreme caution. Unprotected personnel may experience injury or death if residual toxic agents or radioactive material are present. If vehicle is exposed to chemical or biological agents, servicing personnel shall wear protective mask, hood, protective overgarments, and chemical protective gloves and boots. All contaminated air filters shall be placed into double-lined plastic bags and swiftly moved to a segregation area away from the worksite. The same procedure applies for radioactive dust contamination, however, the Company NBC team should measure the radiation prior to filter removal to determine the extent of safety procedures required per the NBC Annex to the unit Standard Operating Procedures (SOP). The segregation area in which the contaminated air filters are temporarily stored shall be marked with appropriate NBC placards. Final disposal of contaminated air filters shall be in accordance with local SOP.

2.	Air cleaner housing (1) and wingnut with captive screw (2)	Cover (3) with attached wingnut (4)	Unscrew and take off.
3.	Air cleaner element (5) and air cleaner housing (1)	Wingnut with captive screw (2)	Unscrew and take off.
4.	Air cleaner housing (1)	Air cleaner element (5)	Take out.

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

WARNING

Compressed air used for blowing away chips, dirt, etc., must leave nozzle at less than 30 psi (207 kPa) to prevent personal injury. Be certain that nozzle is rated to provide a maximum of 30 psi (207 kPa). Be sure to wear safety goggles or lenses when using compressed air. Compressed air and particles moved by compressed air can cause damage to your eyes.

AIR CLEANER ELEMENT – CONTINUED

LOCATION	ITEM	ACTION / REMARKS

CLEANING – CONTINUED

CAUTION

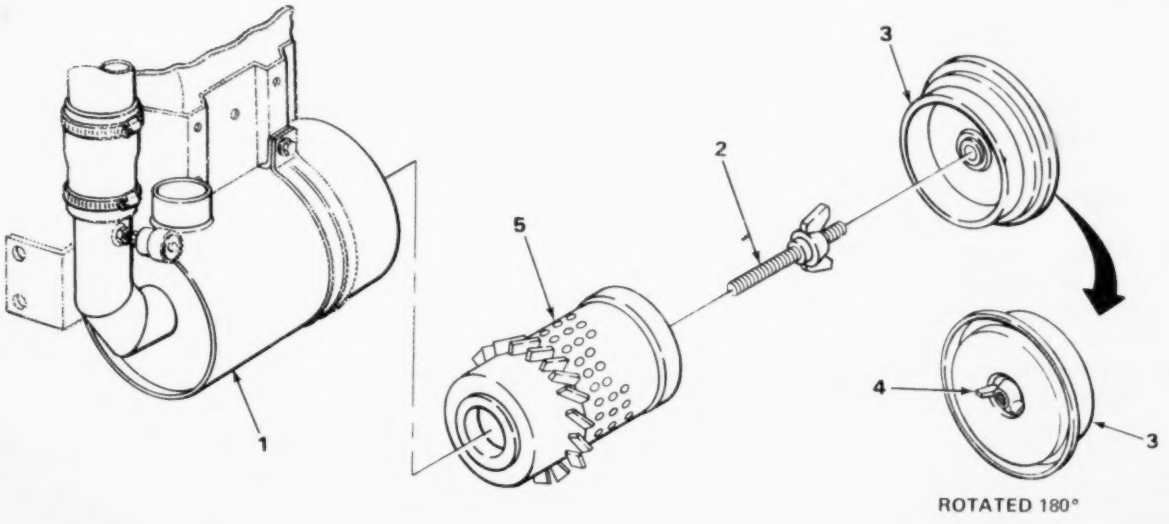
Do not tap air cleaner element against hard surfaces. This could damage element. When using compressed air for cleaning air cleaner element, be sure to use 30 psi (210 kPa) or lower. Compressed air higher than 30 psi (210 kPa) will damage element.

5.	Air cleaner element (5)	a. Tap several times against hand to remove dirt. b. Using compressed air, blow out dirt.

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

6.	Air cleaner housing (1) and cover (3)	a. Using clean rags dampened in drycleaning solvent, wipe clean. b. Using clean, dry rags, wipe dry.
7.	All other metal parts	a. Clean in drycleaning solvent. b. Using clean, dry rags, wipe dry.



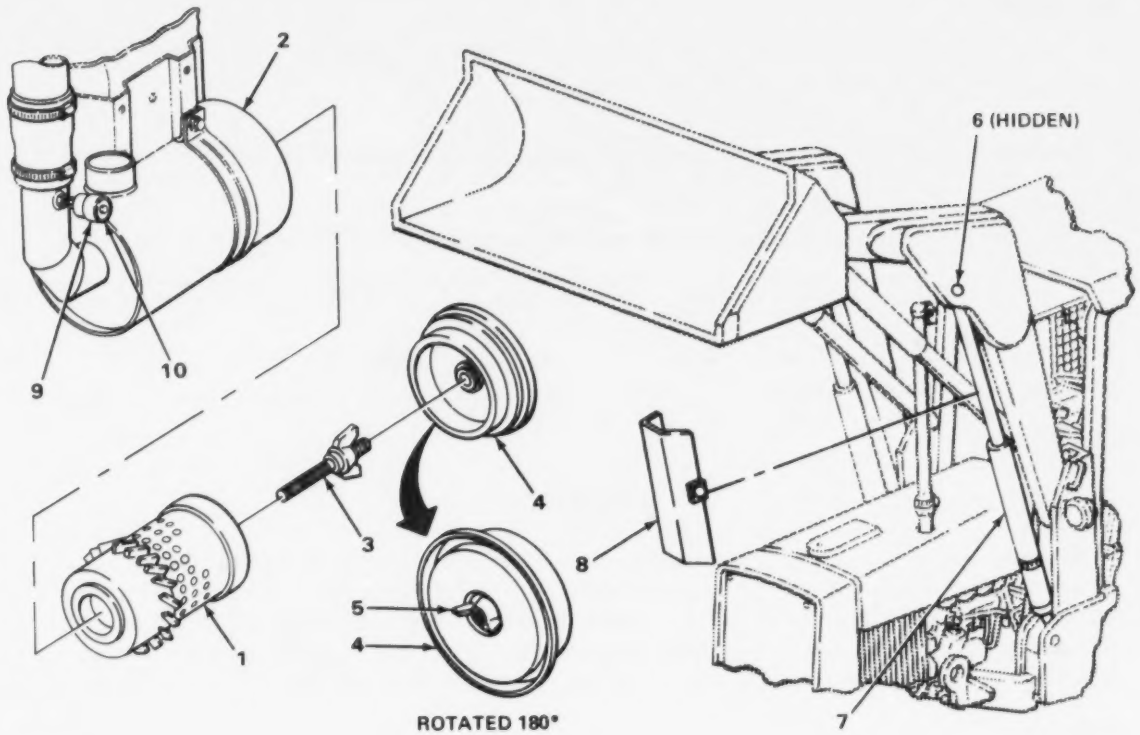
TA234875

AIR CLEANER ELEMENT – CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSPECTION/REPLACEMENT			
		NOTE	
		For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).	
		If defective parts are found, notify Organizational Maintenance.	
8.	Air cleaner element (1)	Look for holes, tears, dented sealing surfaces and excessive dirt which cannot be removed.	
9.	All other parts	Look for cracks and breaks.	
10.	All threaded parts	Look for damaged threads.	
INSTALLATION			
		NOTE	
		The air cleaner element must seal properly against air cleaner housing in order for air restriction indicator to work properly.	
11. Air cleaner housing (2)	Air cleaner element (1)	Place in position.	
12. Air cleaner element (1) and air cleaner housing (2)	Wingnut with captive screw (3)	Screw in and tighten.	
13. Air cleaner housing (2) and wingnut with captive screw (3)	Cover (4) with attached wingnut (5)	a. Place in position. b. Screw on and tighten.	
14. Bucket cylinder rod end (6) and cylinder barrel (7)	Bucket support (8)	Take off.	
15. Air restriction indicator (9)	Reset button (10)	Push in to reset.	

AIR CLEANER ELEMENT – CONTINUED

INSTALLATION – CONTINUED



NOTE

FOLLOW-ON MAINTENANCE:

1. Install right side grille (page 3-60).
2. Lower loader bucket (page 2-83).

TASK ENDS HERE

TA234876

FUEL CAP

This task covers:

a. Removal (page 3-30)
b. Cleaning (page 3-30)
c. Inspection/Replacement (page 3-31)
d. Installation (page 3-31)

INITIAL SETUP

Materials/Parts
Rags, wiping (item 7, appendix D)
Detergent, GP (item 1, appendix D)

Personnel Required
One

LOCATION	ITEM	ACTION REMARKS

REMOVAL

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when checking fuel level or filling fuel tank. Be sure that fuel pump or container nozzle contacts fuel tank filler neck to carry off static electricity. Crew member will stand by with fire extinquisher while loader backhoe is being filled with fuel. Failure to observe these precautions could cause an explosion resulting in serious injury or death.

1.	Hood (1)	Cover (2)	Open.
2.	Fuel tank (3)	Fuel cap (4)	Unscrew and take off.

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

3.		Fuel cap (4)	a. Using clean rags dampened in solution of detergent and water, wipe clean. b. Using clean water, rinse. c. Using clean dry rags, wipe dry.

FUEL CAP – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**

INSPECTION

NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).

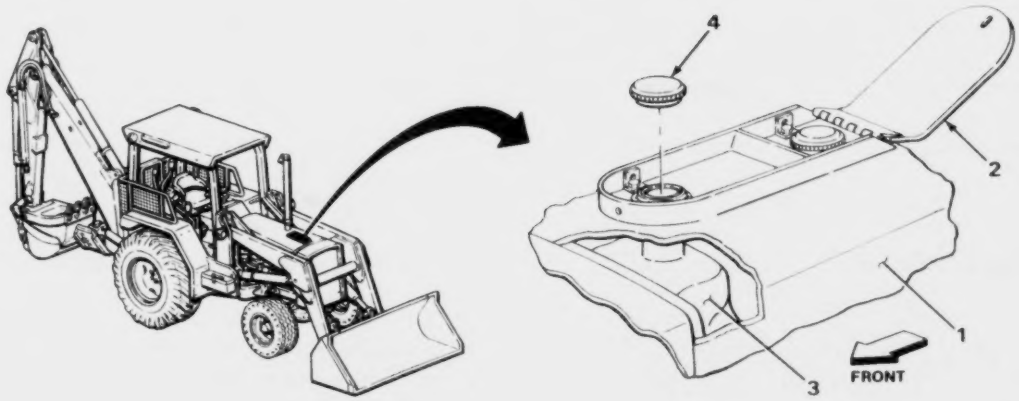
If defective parts are found, notify Organizational Maintenance.

Fuel tank cap must seal tightly to assure adequate pressure in fuel system .

4.		Fuel cap (4)	a. Look for cracks, breaks, and holes. b. Look at gasket for tears, crumbling, and signs of leakage.

INSTALLATION

5.	Fuel tank (3)	Fuel cap (4)	Screw on and tighten.
6.	Hood (1)	Cover (2)	Close.



TASK ENDS HERE

TA234877

FUEL TANK

This task covers:

Filling (3-32)

INITIAL SETUP

Materials/Parts

Diesel fuel (item 2, appendix D)
Rags, wiping (item 7, appendix D)

Personnel Required

Two

Equipment Condition

Fire extinguisher removed (page 3-70).

LOCATION	ITEM	ACTION **REMARKS**

FILLING

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when checking fuel level or filling fuel tank. Be sure that fuel pump or container nozzle contacts fuel tank filler neck to carry off static electricity. Crew member will stand by with fire extinquisher while loader backhoe is being filled with fuel. Failure to observe these precautions could cause an explosion resulting in serious injury or death.

1.	Hood (1)	Cover (2)	Open.
2.	Fuel tank (3)	Fuel cap (4)	a. If cap and area around it are dirty, using clean, dry rags, clean. b. Unscrew and take off.
3.	Grille housing (5)	Fuel tank (3)	a. Have assistant stand by with fire extinguisher. b. Fill with proper diesel fuel to within 2-inches (51 mm) below top. **Air space allows for expansion of fuel.**
4.	Fuel tank (3)	Fuel cap (4)	Screw on and tighten.

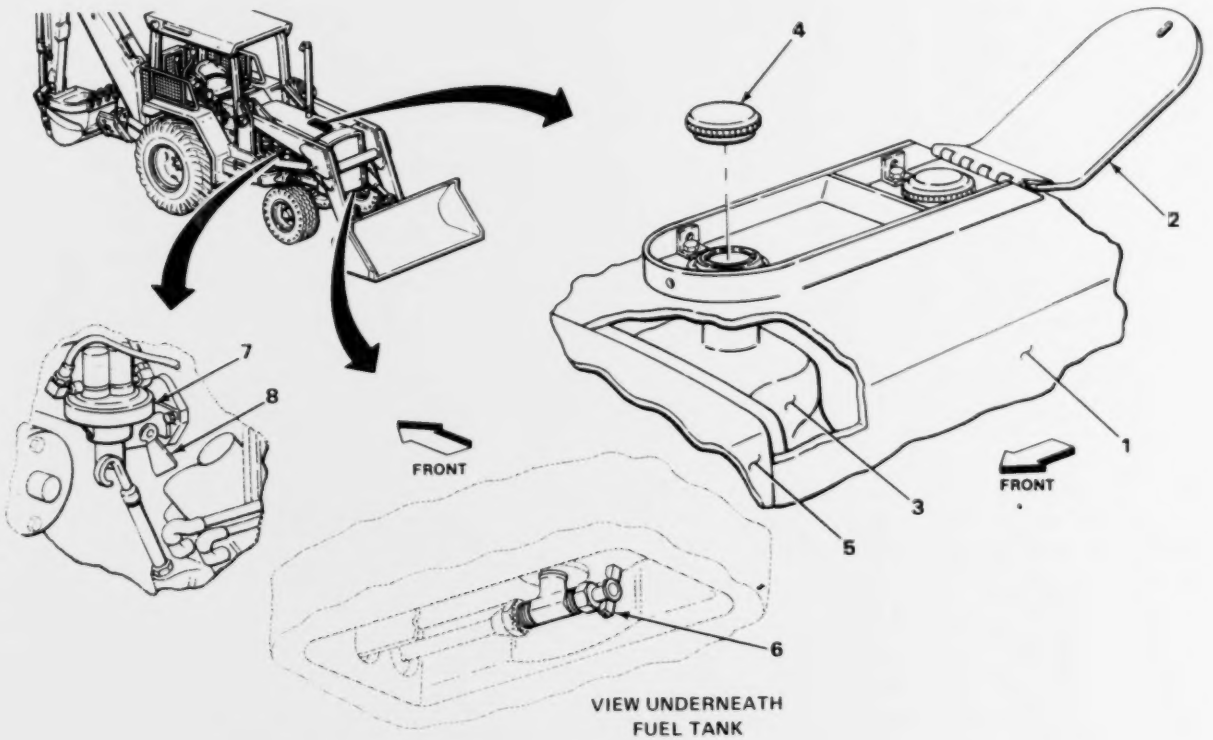
FUEL TANK – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
FILLING – CONTINUED		
5. Fuel tank (3)	Fuel shutoff valve (6)	If not already open, turn counter-clockwise to open.

NOTE

If fuel tank was not empty before filling with fuel, skip step 6.

6. Fuel transfer pump (7)	Primer lever (8)	Move lever in and out several times to prime the pump (7) and leave in closed position (toward engine).
7. Hood (1)	Cover (2)	Close.



NOTE

FOLLOW-ON MAINTENANCE: Install fire extinguisher (page 3-70).

TASK ENDS HERE

TA234878

FUEL SHUTOFF VALVE

This task covers:

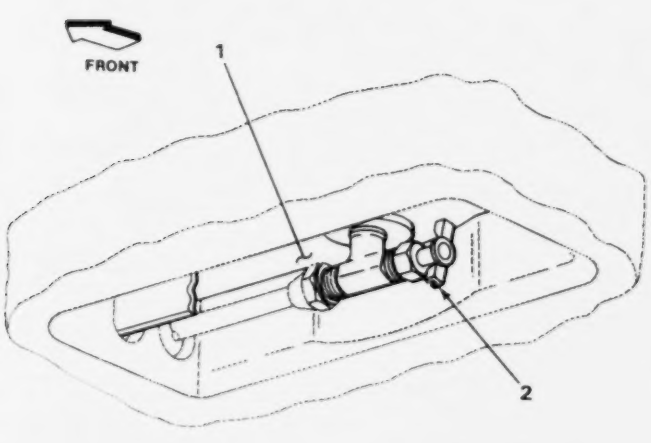
a. Closing (3-34)
b. Opening (page 3-34)

INITIAL SETUP

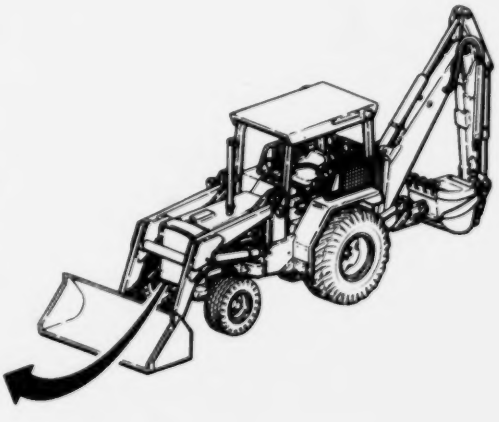
Personnel Required

One

LOCATION	ITEM	ACTION **REMARKS**
CLOSING		
1. Fuel tank (1)	Fuel shutoff valve (2)	Turn clockwise as far as it will turn, to close.
OPENING		
2. Fuel tank (1)	Fuel shutoff valve (2)	Turn counterclockwise as far as it will turn, to open.



VIEW FROM UNDERNEATH



TASK ENDS HERE

TA234879

FUEL FILTER SEDIMENT BOWL PLUGS

This task covers:

a. Removai (page 3-35)
b. Cleaning (page 3-36)
c. Inspection (page 3-36)
d. Installation (page 3-36)

INITIAL SETUP

Tools

Container, metal, 1/2-gallon (Organizational Maintenance)
Pliers, slip-joint (Organizational Maintenance)

Materials/Parts

Detergent, GP (item 1, appendix D)
Rags, wiping (item 7, appendix D)

Personel Required

One

LOCATION	ITEM	ACTION	REMARKS

NOTE

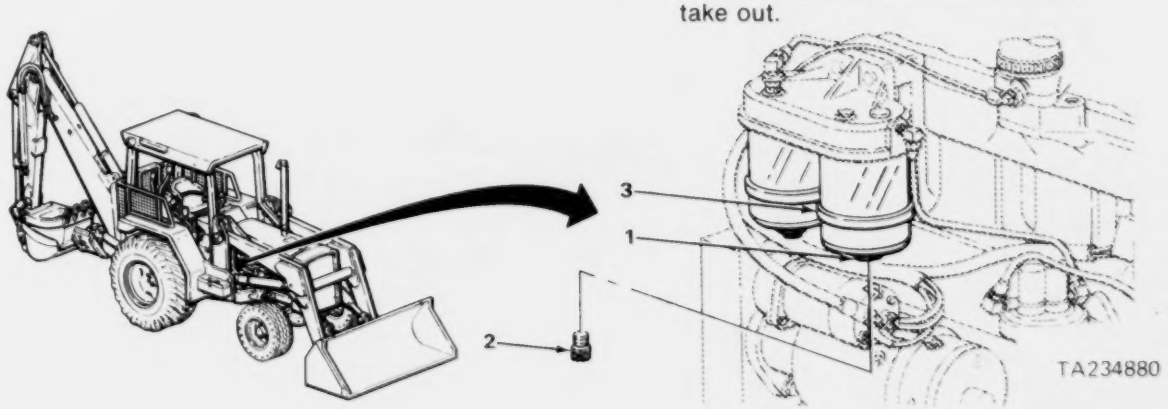
There are two fuel filter sediment bowls on this vehicle. Both are drained the same way. Right bowl is shown. Repeat procedures for left bowl as needed.

REMOVAL

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when draining fuel filter sediment bowl. Failure to observe these precautions could cause serious injury or death.

1.	Screw (1)	Plug (2)	a. Place container under sediment bowl (3). b. Using slip-joint pliers, unscrew and take out.



FUEL FILTER SEDIMENT BOWL PLUGS – CONTINUED

LOCATION	ITEM	ACTION / REMARKS

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

2.		Plug (1) with packing (2)	a. Using clean rags dampened in solution of detergent and water, wipe clean. b. Using clean water, rinse. c. Using clean dry rags, wipe dry.

INSPECTION

NOTE

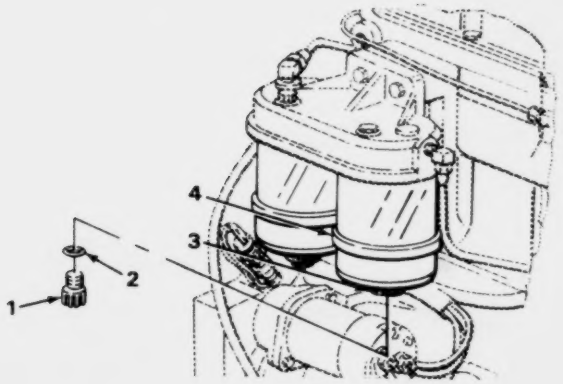
For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).

If defective parts are found, notify Organizational Maintenance.

3.		Plug (1) with packing (2)	Look for cracks, breaks, holes, and deterioration.

INSTALLATION

4.	Screw (3)	Plug (1)	Screw in and tighten using slip joint pliers. **If sediment bowl (4) leaks, notify Organizational Maintenance.**



TASK ENDS HERE

TA234881

FUEL FILTER SEDIMENT BOWL

This task covers:

Draining (page 3-37)

INITIAL SETUP

Tools	Personnel Required
Container, metal, 1/2-gallon (Organizational Maintenance) Pliers, slip-joint (Organizational Maintenance)	One

LOCATION	ITEM	ACTION / REMARKS

NOTE

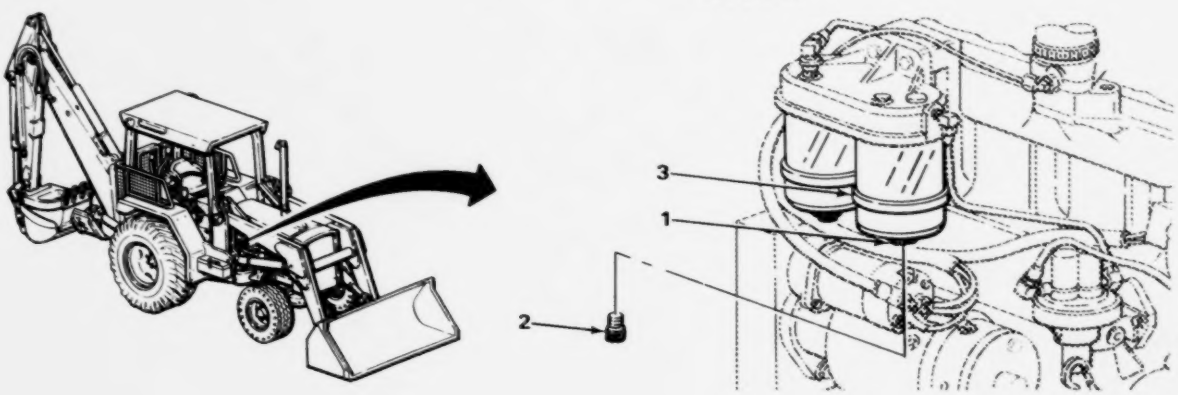
There are two fuel filter sediment bowls on this vehicle. They are both drained the same way. Right bowl is shown. Repeat the following procedures for left bowl as needed.

DRAINING

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when draining fuel filter sediment bowl. Failure to observe these precautions could cause serious injury or death.

1.	Screw (1)	Plug (2)	a. Place container under sediment bowl (3). b. Using slip-joint pliers, unscrew and take out.



TA234882

FUEL FILTER SEDIMENT BOWL – CONTINUED

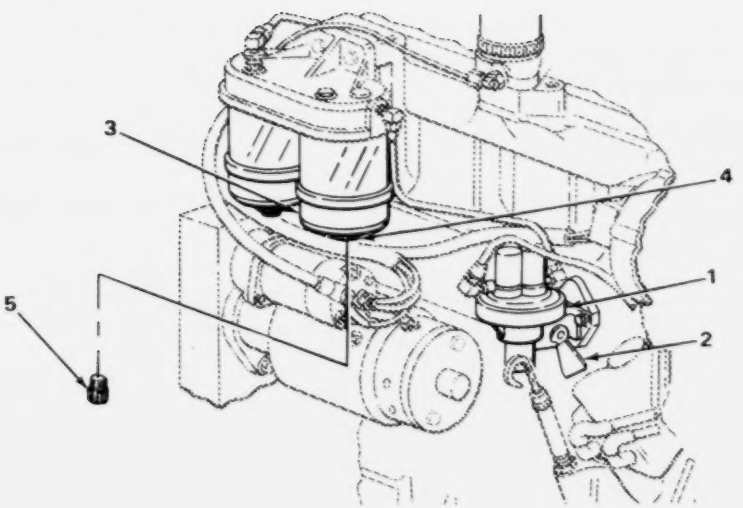
LOCATION	ITEM	ACTION / REMARKS

DRAINING – CONTINUED

WARNING

Fuel burns easily. Fuel fumes are explosive. Do not smoke or allow open flame nearby when draining fuel filter sediment bowl. Failure to observe these precautions could cause serious injury or death.

2.	Fuel transfer pump (1)	Lever (2)	a. Pump in and out several times, until all fuel has drained from sediment bowl (3). **Fuel will not drain properly unless lever is pulled all the way back while pumping.** b. After fuel has drained, push in toward engine to closed position. c. Get rid of drained diesel fuel.
3.	Screw (4)	Plug (5)	Screw in and tighten using slip joint pliers. **If sediment bowl (3) leaks, notify Organizational Maintenance.**



TASK ENDS HERE

TA234883

ENGINE PRIMER FLUID

This task covers:

a. Removal (page 3-39)
b. Cleaning (page 3-39)
c. Inspection (page 3-40)
d. Installation (page 3-40)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning (item 9, appendix D)

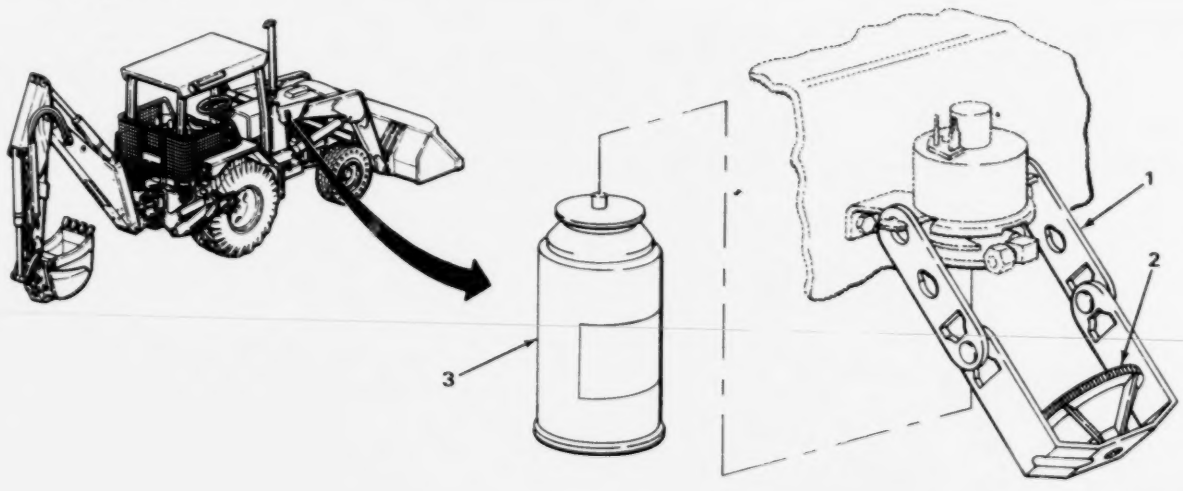
Personnel Required

One

LOCATION	ITEM	ACTION / REMARKS
REMOVAL		
1. Bail (1)	Base (2)	a. Unscrew by turning clockwise. b. Pull forward.
2.	Engine primer fluid (3)	Take out.
CLEANING		

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).



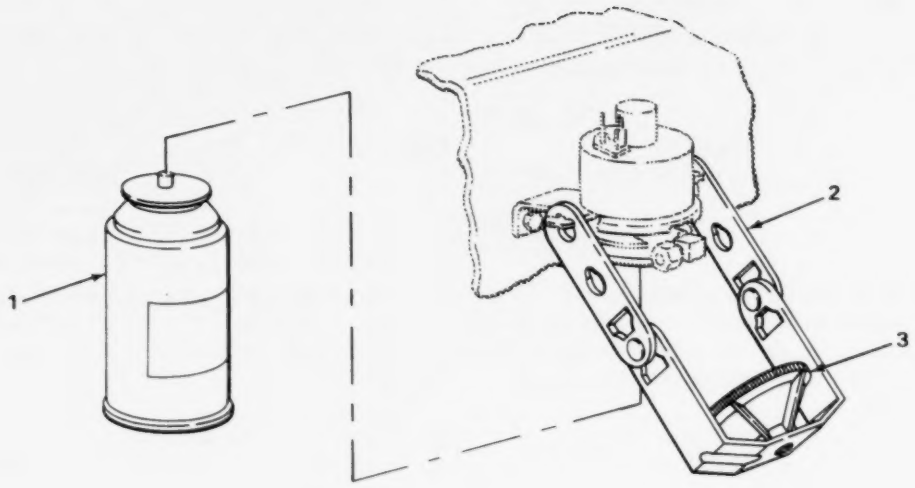
TA234884

ENGINE PRIMER FLUID – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
CLEANING – CONTINUED		
		WARNING Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.
3.	Engine primer fluid (1)	a. Using clean, dry rags dampened with drycleaning solvent, wipe clean. b. Using clean, dry rags, wipe dry.
INSPECTION		
		NOTE For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15). Notify Organizational Maintenance if new engine primer fluid is needed.
4.	Engine primer fluid (1)	a. Shake to see if empty. b. Look for cracks, dents, and bent valve stems.
INSTALLATION		
5. Bail (2)	Engine primer fluid (1)	Place in position.
6.	Base (3)	Screw until tight by turning counter-clockwise.

ENGINE PRIMER FLUID – CONTINUED

INSTALLATION – CONTINUED



TASK ENDS HERE

Section VI. COOLING SYSTEM

	Page		Page
Radiator	3-41	Radiator Filler Opening Cap	3-43

RADIATOR

This task covers:

Filling (page 3-42)

INITIAL SETUP

Materials/Parts	Personnel Required
Container, metal 1/2-gallon (Organizational Maintenance) Rags, wiping (item 7, appendix D)	One

TA234885

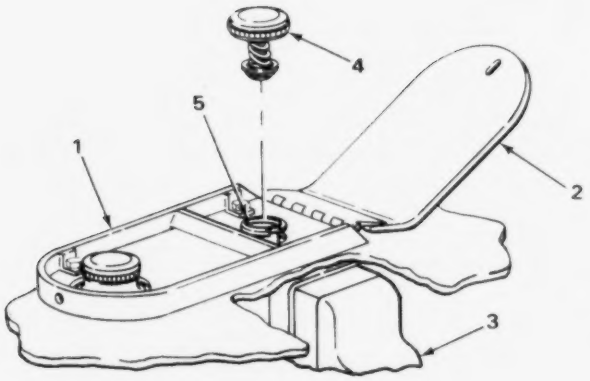
RADIATOR – CONTINUED

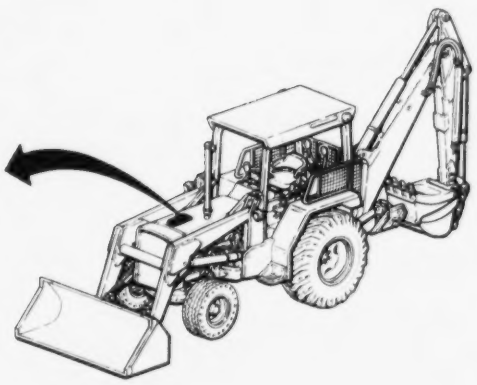
LOCATION	ITEM	ACTION / REMARKS
FILLING		
1. Hood (1)	Cover (2)	Open.

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Use a rag to cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take it off of radiator.

2. Radiator (3)	Radiator filler opening cap (4)	a. Using rags over cap, unscrew. b. Push down, unscrew, and take off.
3.	Radiator filler neck (5)	a. Check coolant level. **Radiator should be filled to halfway point between radiator core and filler neck.** b. If coolant level is low, fill with a mixture of clean water and antifreeze (TM 750-254).
4.	Radiator filler opening cap (4)	Screw on and tighten.
5. Hood (1)	Cover (2)	Close.





TASK ENDS HERE

TA234886

RADIATOR FILLER OPENING CAP

This task covers:

a. Removal (page 3-43)
b. Cleaning (page 3-44)
c. Inspection (page 3-44)
d. Installation (page 3-44)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Detergent, GP (item 1, appendix D)

Personnel Required

One

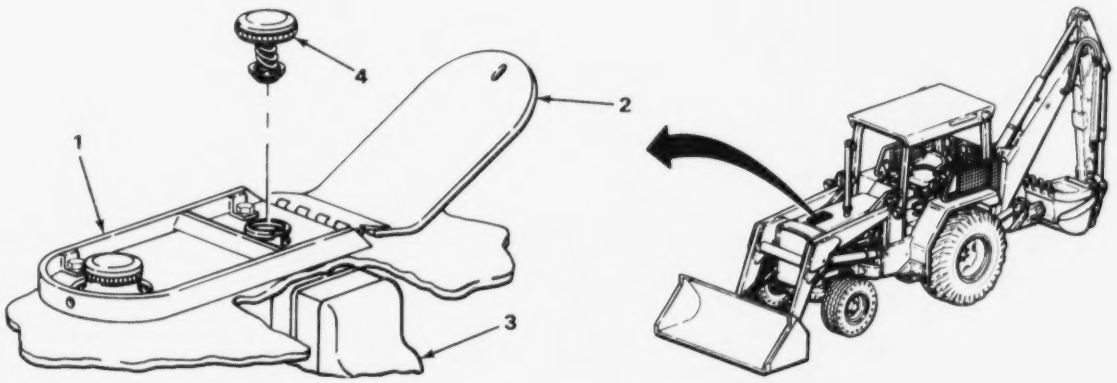
LOCATION	ITEM	ACTION	REMARKS

REMOVAL

WARNING

Be careful when removing radiator cap. If engine is hot, escaping steam could burn you. Use a rag to cover radiator cap to protect your hand. Unscrew cap just enough to allow any built-up steam to escape. When all pressure has been relieved, unscrew cap the rest of the way, and take it off of radiator.

1.	Hood (1)	Cover (2)	Open.
2.	Radiator (3)	Radiator filler opening cap (4)	a. Using rags over cap, unscrew. b. Push down, unscrew, and take off.



TA234887

RADIATOR FILLER OPENING CAP – CONTINUED

LOCATION	ITEM	ACTION / REMARKS

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

3.	Radiator filler opening cap (1)	a. Using clean rags, soap, and water, wipe clean. b. Using clean water, rinse. c. Using clean, dry rags, wipe dry.

INSPECTION

NOTE

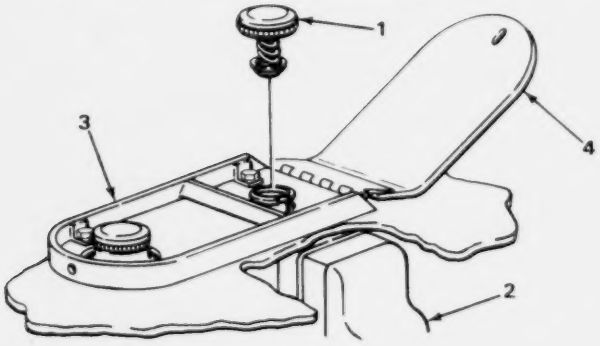
For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15). If defective parts are found, notify Organizational Maintenance.

Cap must seal tightly to assure adequate pressure in engine cooling system.

4.	Radiator filler opening cap (1)	a. Look for cracks, breaks, and holes. b. Look at gasket for tears, crumbling, and for leakage.

INSTALLATION

5. Radiator (2)	Radiator filler opening cap (1)	Push down, screw on and tighten.
6. Hood (3)	Cover (4)	Close.



TASK ENDS HERE

TA234888

Section VII. ELECTRICAL SYSTEM

	Page		Page
Battery Cleaning	3-51	Cigar Lighter Element	3-47
Battery Filling and Clamp Tightening	3-49	Ignition Key	3-45

IGNITION KEY

This task covers:

a. Cleaning (page 3-45)
b. Inspection (page 3-46)
c. Installation (page 3-46)
d. Removal (page 3-46)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning (item 9, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

IGNITION KEY – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

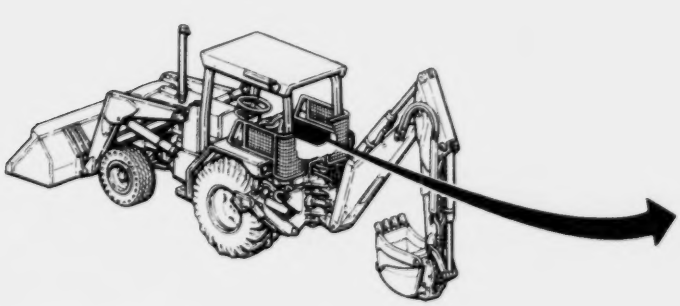
1.	Key (1)	a. Clean in drycleaning solvent. b. Using clean dry rags, wipe dry.
INSPECTION		

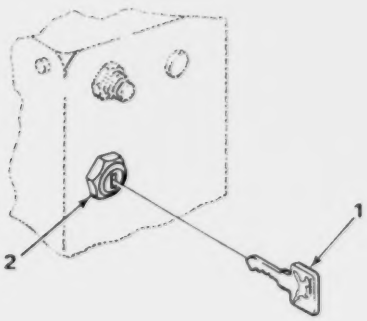
NOTE

For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).

If defective parts are found, notify Organizational Maintenance.

2.	Key (1)	Look for cracks, breaks, and wear.
INSTALLATION		
3. Ignition switch (2)	Key (1)	Place in position.
REMOVAL		
4. Ignition switch (2)	Key (1)	Take out.





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TA234

CIGAR LIGHTER ELEMENT

This task covers:

a. Removal (page 3-47)
b. Cleaning (page 3-47)
c. Inspection (page 3-48)
d. Installation (page 3-48)

INITIAL SETUP

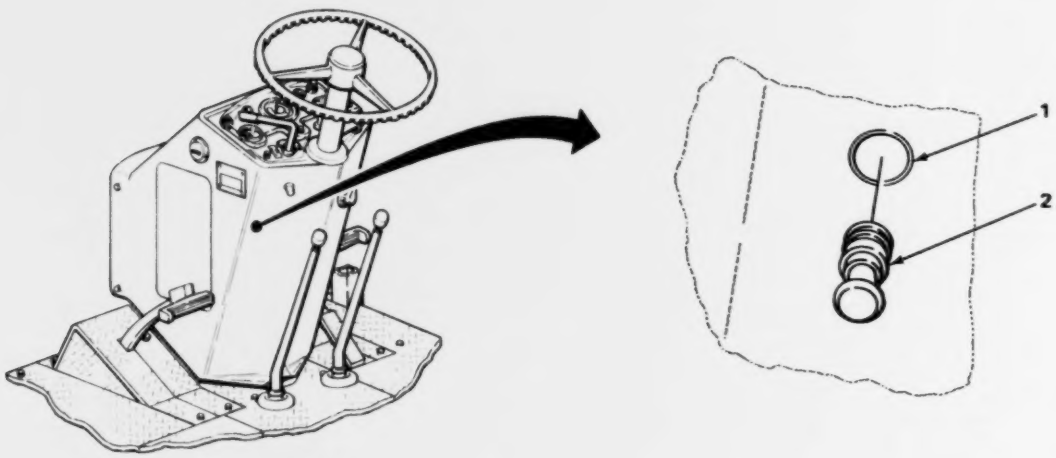
Materials/Parts	Personnel Required
Rags, wiping (item 7, appendix D)	One

LOCATION	ITEM	ACTION **REMARKS**
REMOVAL		
1. Lighter (1)	Element (2)	Pull out.
CLEANING		

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

2.	Element (2)	Using clean, dry rags, wipe clean.



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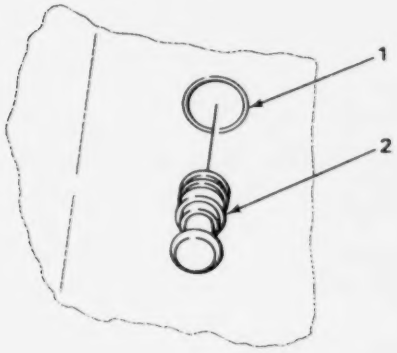
CIGAR LIGHTER ELEMENT – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
INSPECTION		
	NOTE	
	For more information on how to inspect parts, go to General Maintenance Instruction (page 3-15).	
	If defective parts are found, notify Organizational Maintenance.	
3.	Element (1)	Look for cracks, breaks, and corrosio
INSTALLATION		
4. Lighter (2)	Element (1)	Push in.



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BATTERY FILLING AND CLAMP TIGHTENING

This task covers:

Filling and Clamp Tightening (page 3-49)

INITIAL SETUP

Tools

Battery filler, gravity (Organizational Maintenance)
Wrench, adjustable, 12-inch (Organizational Maintenance)

Materials/Parts

Water, distilled (item 3, appendix D)

Personnel Required

One

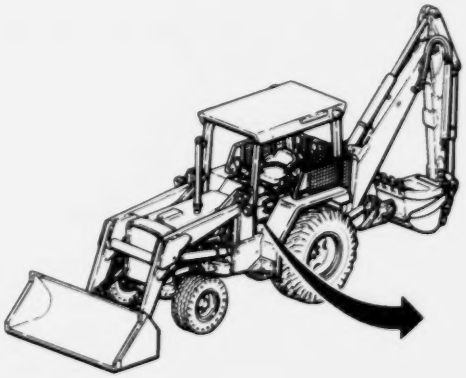
LOCATION	ITEM	ACTION **REMARKS**

FILLING AND CLAMP TIGHTENING

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

1.	Battery cover (1) and left fender (2)	Two screws (3)	Using 12-inch adjustable wrench, unscrew part way.
2.	Floor support (4)	Battery cover (1)	Take off.



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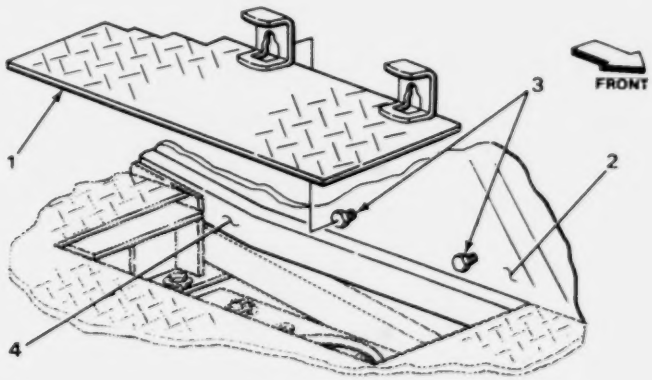


TA234892

BATTERY FILLING AND CLAMP TIGHTENING – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
FILLING AND CLAMP TIGHTENING – CONTINUED		

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

NOTE

There are two batteries on this vehicle. Both batteries are serviced the same. One is shown. Repeat steps 3 thru 6 for the other battery as needed.

3.	Battery (1)	Three vent caps (2)	Pull off.
4.	Battery tray (3)	Battery (1)	a. Check electrolyte level in each cell. **Electrolyte level should be level with split ring at bottom of vent.**

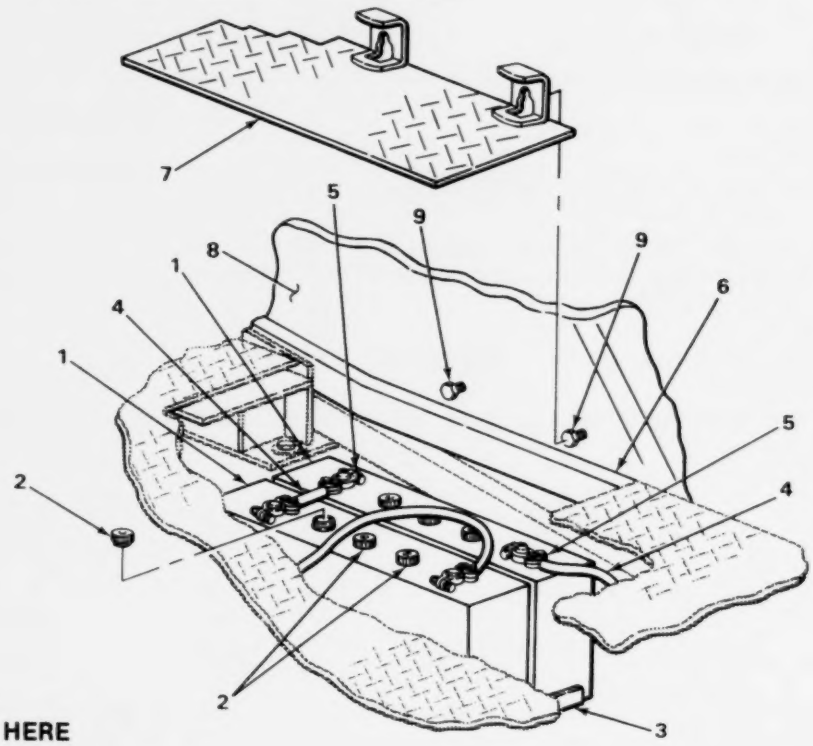
CAUTION

If freezing weather, run engine at least 15 minutes after adding water to batteries.

			b. If electrolyte level in a cell is low, using gravity battery filler, fill to level of split ring with distilled water. **Do not overfill.**
5.	Battery (1)	Three vent caps (2)	Push on.
6.	Two battery cables (4)	Two battery cable clamps (5)	If loose, using 12-inch adjustable wrench, tighten.
7.	Floor support (6)	Battery cover (7)	Place in position.
8.	Battery cover (7) and left fender (8)	Two screws (9)	Using 12-inch adjustable wrench, tighten.

BATTERY FILLING AND CLAMP TIGHTENING – CONTINUED

FILLING AND CLAMP TIGHTENING – CONTINUED



TASK ENDS HERE

BATTERY CLEANING

This task covers:

Cleaning (page 3-52)

INITIAL SETUP

Tools

Brush, stiff bristle
(Organizational Maintenance)
Brush, wire
(Organizational Maintenance)
Wrench, adjustable, 12-inch
(Organizational Maintenance)

Materials/Parts

Grease, GAA (item 5, appendix D)
Rags, wiping (item 7, appendix D)
Sodium bicarbonate (item 8, appendix D)

Personnel Required

One

BATTERY CLEANING – CONTINUED

LOCATION	ITEM	ACTION / REMARKS

CLEANING

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

1.	Battery cover (1) and left fender (2)	Two screws (3)	Using 12-inch adjustable wrench, unscrew part way.
2.	Floor support (4)	Battery cover (1)	Take off.

WARNING

Electrolyte and battery corrosion can cause injury to you. Wear safety goggles and gloves. If for any reason electrolyte or battery corrosion contacts the eyes, skin or clothing, flush immediately with large amounts of cool water and seek medical attention immediately.

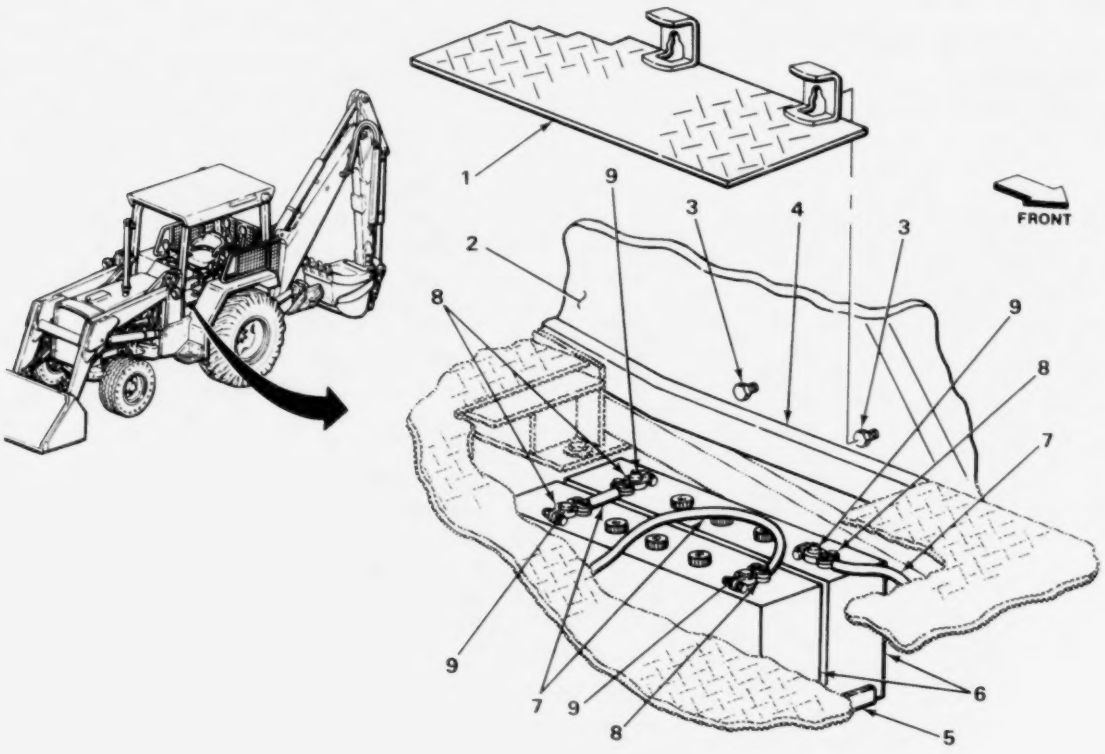
CAUTION

Be careful not to get soda solution in battery cells. Make sure vent caps are tight and avoid getting solution in vent cap holes. Soda solution will contaminate electrolyte.

3.	Center platform (5)	Two batteries (6), three cables (7), four terminal lugs (8), and four terminal posts (9)	a. Using wire brush, clean off corrosion and dirt from all metal parts. b. Using solution of about 1/2-pound (0.28 kg) baking soda for each gallon (3.8 liters) of water, and stiff bristle brush, clean and flush until no bubbles appear when new solution is applied. c. Using clean water, rinse. d. Using clean, dry rags, wipe dry.

BATTERY CLEANING – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
CLEANING – CONTINUED		
4. Two batteries (6)	Three cables (7), four terminal lugs (8), and four terminal posts (9)	Apply GAA grease about 1/8-inch (3 mm) thick to top, sides, and bottom of connections. **Avoid getting grease between terminal posts and terminal lugs.**
5. Floor support (4)	Battery cover (1)	Place in position.
6. Battery cover (1) and left fender (2)	Two screws (3)	Tighten using 12-inch adjustable wrench.



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TA234894

Section VIII. TRANSMISSION

	Page		Page
Transmission	3-54	Transmission Dipstick	3-56

TRANSMISSION

This task covers:

Filling (page 3-54)

INITIAL SETUP

Materials/Parts	Personnel Required
Rags, wiping (item 7, appendix C)	One

LOCATION	ITEM	ACTION **REMARKS**

FILLING

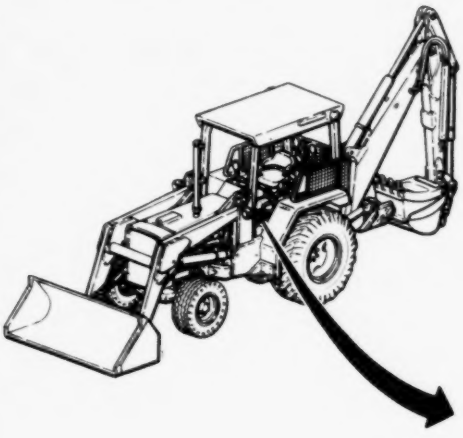
1.	Loader backhoe	Engine	Start and warm up for about 3 minutes (page 2-61). **Make sure speed gear assembly (reverser), range transmission shifter, and gear transmission shifter are in neutral position, and clutch is engaged.**
2.	Center platform (1)	Filler lock (2)	Move aside.
3.	Filler tube (3)	Dipstick (4)	a. Loosen. b. Pull out. c. Using clean, dry rag, wipe off oil. d. Place back in position. e. Pull out, read oil level. f. If oil reading is below bottom line on shaft, go to step 4. g. If oil level is correct, place in position and tighten.

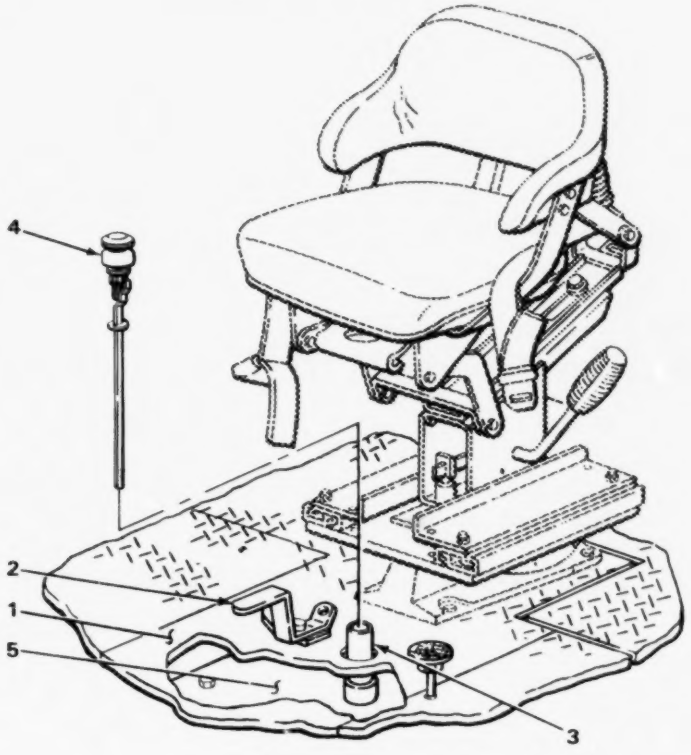
NOTE

If transmission oil level is correct, skip steps 4 and 5.

TRANSMISSION – CONTINUED

	LOCATION	ITEM	ACTION / REMARKS
	FILLING – CONTINUED		
4.	Transmission cover (5)	Filler tube (3)	a. Add proper amount and grade of oil (LO 5-2420-222-12). b. Using clean, dry rags, wipe up any excess oil that may have spilled.
5.	Filler tube (3)	Dipstick (4)	a. Place in position. b. Pull out, read oil level. c. If oil level is below bottom line on shaft, repeat step 5. d. If oil level is correct, slide in position. e. Tighten.
6.	Center platform (1)	Filler lock (2)	Move over top of dipstick (4).





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TA234895

TRANSMISSION DIPSTICK

This task covers:

a. Removal (page 3-56)
b. Cleaning (page 3-56)
c. Inspection (page 3-56)
d. Installation (page 3-57)

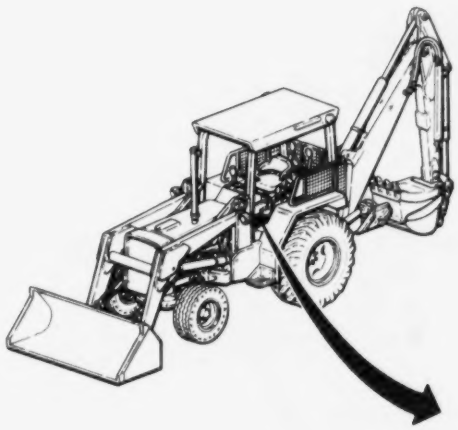
INITIAL SETUP

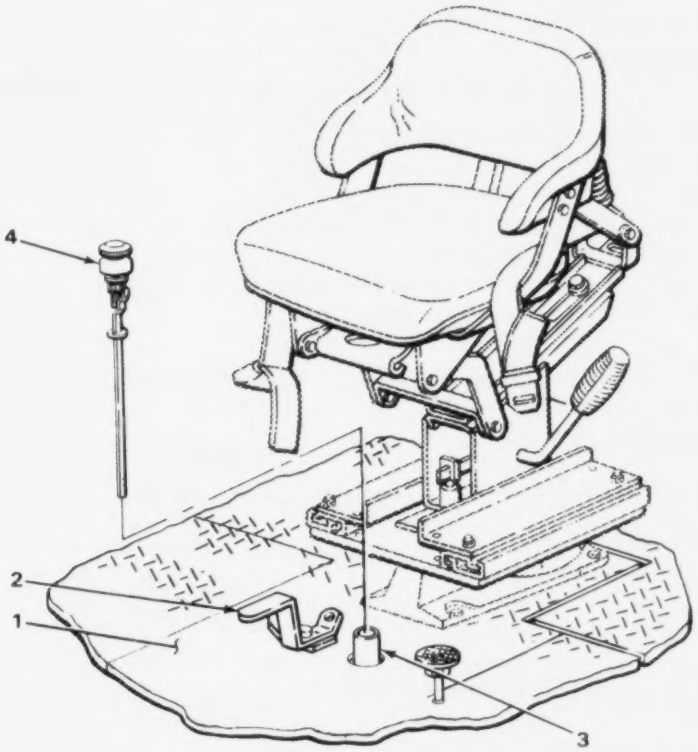
Materials/Parts	Personnel Required
Rags, wiping (item 7, appendix D)	One

LOCATION	ITEM	ACTION / REMARKS
REMOVAL		
1. Center platform (1)	Filler lock (2)	Move aside.
2. Filler tube (3)	Dipstick (4)	a. Loosen. b. Pull out.
CLEANING		
	NOTE	
For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).		
3.	Dipstick (4)	Using clean, dry rag, wipe clean.
INSPECTION		
	NOTE	
For more information on how to inspect parts, go to General Maintenance Instruct (page 3-15).		
If defective parts are found, notify Organizational Maintenance.		
4.	Dipstick (4)	Look for cracks and breaks.

TRANSMISSION DIPSTICK – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
INSTALLATION		
5. Filler tube (3)	Dipstick (4)	a. Slide into position. b. Tighten.
6. Center platform (1)	Filler lock (2)	Move over top of dipsitck (4).





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TA234896

Section IX. WHEELS AND TRACKS

Page

Tire Air Inflation 3-58

TIRE AIR INFLATION

This task covers:

Air Inflation (page 3-58)

INITIAL SETUP

Tools	Personnel Required
Compressor, reciprocating air (Organizational Maintenance) Gage, tire pressure, 10 to 160 psi (Organizational Maintenance) Hose, air compressor (Organizational Maintenance) Inflator gage, pneumatic tire (Organizational Maintenance)	One

LOCATION	ITEM	ACTION REMARKS

AIR INFLATION

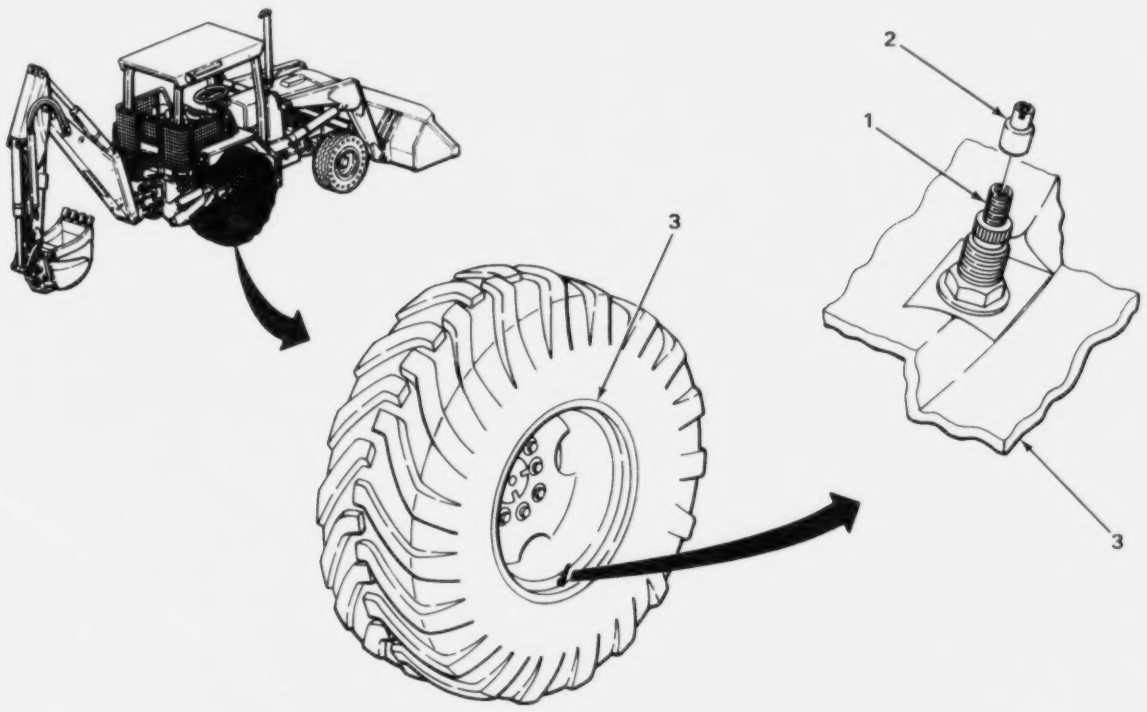
NOTE

Tire inflation procedure is the same for all four tires. Right rear tire is shown. Repeat procedure for other tires as needed.

1.	Valve (1)	Valve cap (2)	Unscrew and take off.
2.	Wheel (3)	Valve (1)	a. Using 10 to 160 psi tire pressure gage, check air pressure. **Tire pressure should be 48 psi (330 kPa) for front tires and 22 psi (150 kPa) for rear tires.** b. If tire pressure is too low, using reciprocating air compressor, air compressor hose, and pneumatic ti inflator gage, add correct amount of air.

TIRE AIR INFLATION – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
AIR INFLATION – CONTINUED		
2. Continued		c. If tire pressure is too high, using pointed end of valve cap, release some air. Repeat step a.
3. Valve (1)	Valve cap (2)	When tire pressure is correct, screw on and tighten.



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TA234897

Section X. BODY, CAB, HOOD, AND HULL

	Page		Pag
Battery Cover	3-63	Side Grilles	3-6
Seat Supports	3-65	Tool Box	3-6

SIDE GRILLES

This task covers:

a. Removal (page 3-60)
b. Cleaning (page 3-60)
c. Inspection (page 3-62)
d. Installation (page 3-62)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning
(item 9, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS

NOTE

There are two side grilles on this vehicle, one on each side of engine. They are the same. The right side is shown. Repeat the following procedure for left side as needed.

REMOVAL

1.	Front support (1)	Grille (2)	Pull top out and lift up on bottom.
2.	Grille (2)	Spring (3)	Take off.

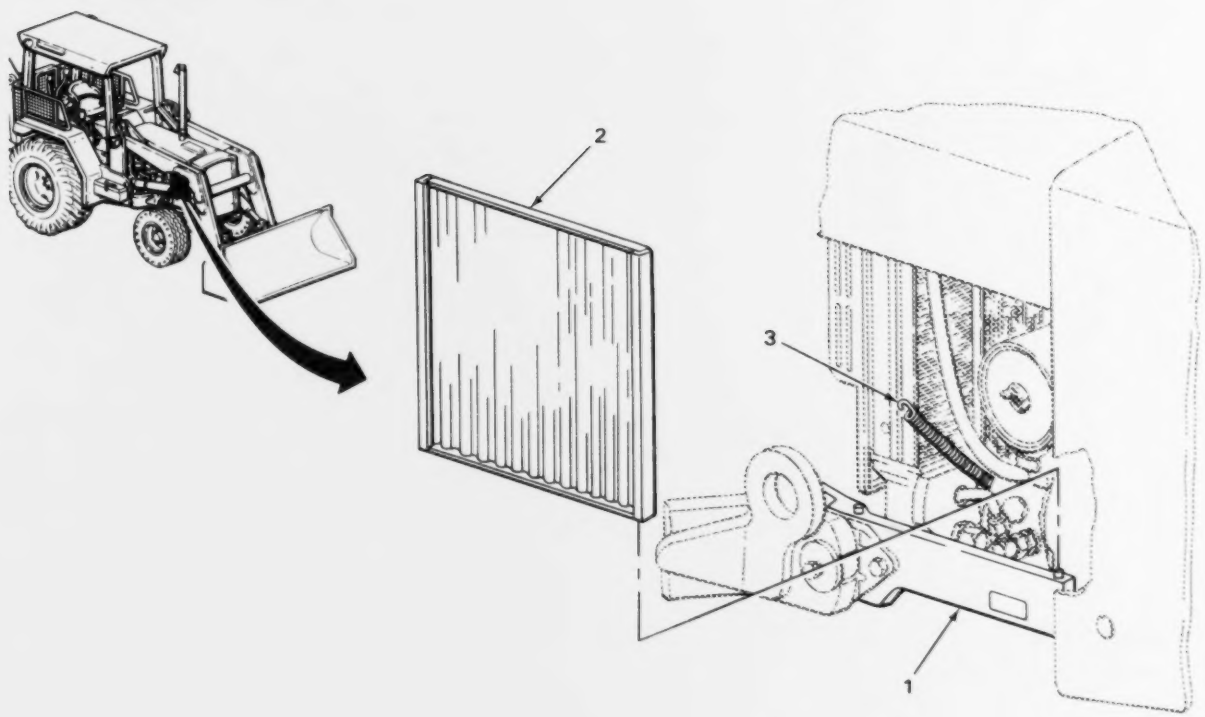
CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

SIDE GRILLES – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
CLEANING – CONTINUED		
		WARNING Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.
3.	Grille (2)	a. Using clean rags dampened in drycleaning solvent, wipe clean. b. Using clean, dry rags, wipe dry.
4.	Spring (3)	a. Clean in drycleaning solvent. b. Using clean, dry rags, wipe dry.



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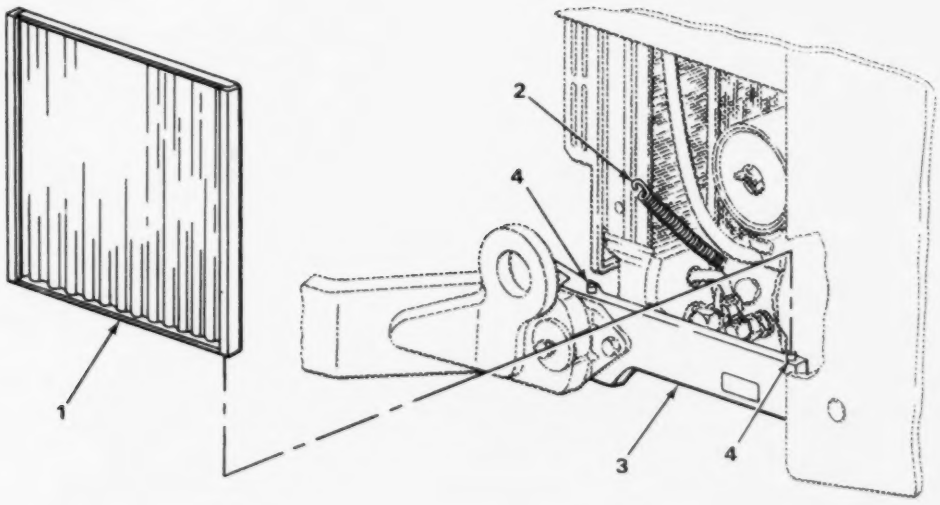
SIDE GRILLES – CONTINUED

LOCATION	ITEM	ACTION	REMARKS
INSPECTION			
		NOTE	
		For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).	
		If parts are found to be defective, notify Organizational Maintenance.	
5.	Grille (1)	Look for holes, cracks, breaks, and dents	
6.	Spring (2)	Look for breaks and bends.	
INSTALLATION			
7. Grille (1)	Spring (2)	Put on.	
8. Front support (3) and two pins (4)	Grille (1)	Place in position with holes in bottom of grille (1) on pins (4) of front support (3).	



TASK ENDS HERE

BATTERY COVER

This task covers:

a. Removal (page 3-63)
b. Cleaning (page 3-64)
c. Inspection (page 3-64)
d. Installation (page 3-64)

INITIAL SETUP

Tools

Wrench, adjustable, 12-inch

Materials/Parts

Rags, wiping (item 7, appendix D)
Solvent, drycleaning (item 9, appendix D)

Personnel Required

One

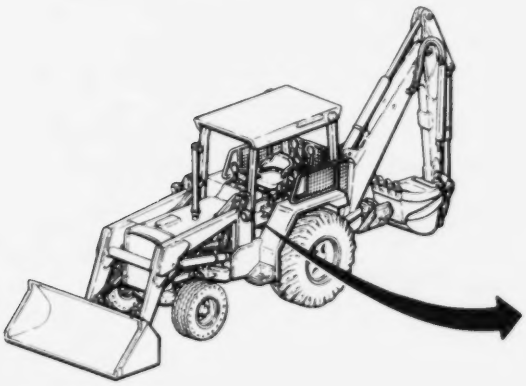
LOCATION	ITEM	ACTION / REMARKS

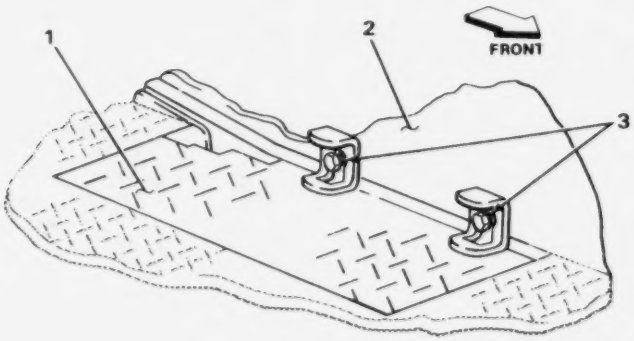
REMOVAL

WARNING

Do not smoke, use open flame, or allow sparks near batteries. The mixture of oxygen and hydrogen gases released from batteries is highly flammable and can explode causing serious injury or death.

1. Battery cover (1) and left fender (2)	Two screws (3)	Using 12-inch adjustable wrench, unscrew part way.





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TA234900

BATTERY COVER – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
REMOVAL – CONTINUED		
2. Floor support (1)	Battery cover (2)	Take off.
CLEANING		

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

3.	Battery cover (2)	a. Using clean, dry rags dampened in drycleaning solvent, wipe clean. b. Using clean, dry rags, wipe dry.
4.	All threaded parts	a. Clean in drycleaning solvent. b. Using clean, dry rags, wipe dry.
INSPECTION		

NOTE

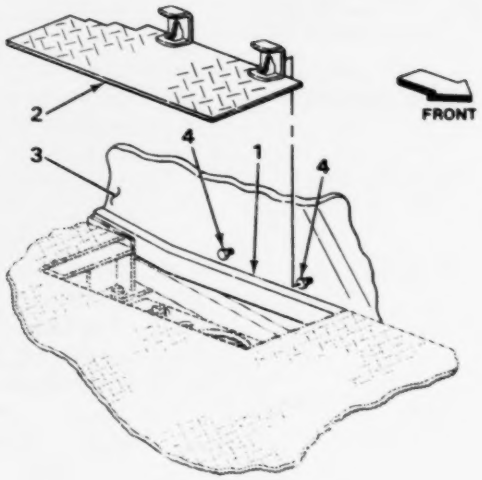
For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).

If parts are found to be defective, notify Organization Maintenance.

5.	Battery cover (2)	Look for cracks and breaks.
6.	All threaded parts	Look for damaged threads.
INSTALLATION		
7. Floor support (1)	Battery cover (2)	Place in position.
8. Battery cover (2) and left fender (3)	Two screws (4)	Tighten using 12-inch adjustable wrench.

BATTERY COVER – CONTINUED

INSTALLATION CONTINUED



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SEAT SUPPORT

This task covers:

Adjustment (page 3-65)

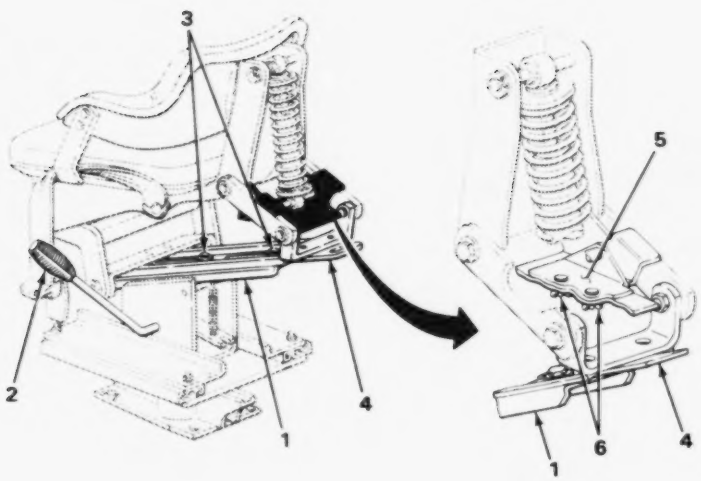
INITIAL SETUP

Tools	Personnel Required
Pliers, slip-joint (Organizational Maintenance) Wrench, adjustable, 12-inch (Organizational Maintenance)	One

TA234901

SEAT SUPPORT – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
ADJUSTMENT		
1. Seat lower support (1)	Control handle (2)	a. Pull up to slide seat forward or backward, or to turn seat 180 degrees. b. If movement is sticky and does not move smoothly, lubricate in accordanc with LO 5-2420-222-12.
2.	Two screws (3)	a. Using 12-inch adjustable wrench, unscrew part way. b. Slide upper support (4) forward to lower seat, slide back to raise seat. c. If movement is sticky and does not move smoothly, lubricate in accordanc with LO 5-2420-222-12. d. Tighten using 12-inch adjustable wrench.
3. Support (5)	Two wingnuts (6)	a. Unscrew part way. **You may need slip-joint pliers from Organizational Maintenance.** b. Slide support (5) forward to set weight adjustment for stiffer tension. c. If movement is sticky and does not move smoothly, lubricate in accordanc with LO 5-2420-222-12. d. Using slip-joint pliers, screw in and tighten.



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TA2349

TOOLBOX

This task covers:

a. Removal (page 3-67)
b. Cleaning (page 3-68)
c. Inspection (page 3-68)
d. Installation (page 3-68)

INITIAL SETUP

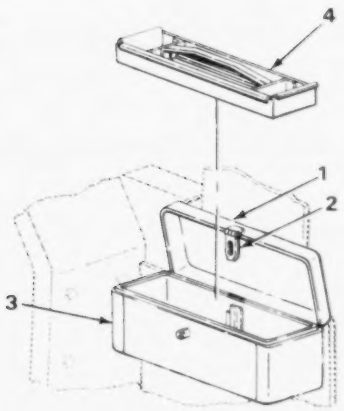
Materials/Parts

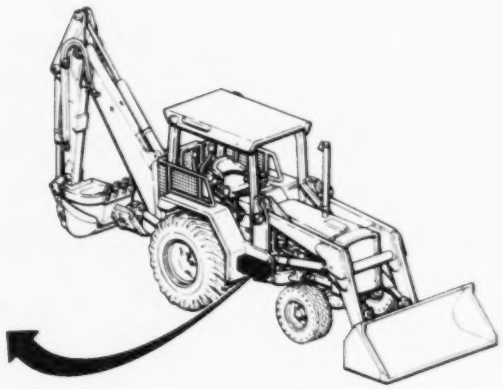
Rags, wiping (item 7, appendix D)
Solvent, drycleaning
(item 9, appendix D)

Personnel Required

One

LOCATION	ITEM	ACTION **REMARKS**
REMOVAL		
1. Toolbox cover (1)	Latch (2)	Pull up.
2. Toolbox (3)	Toolbox cover (1)	Lift up.
3.	Tray (4)	Lift up and take out.





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TOOLBOX – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
REMOVAL – CONTINUED		
4. Toolbox (1) and bracket (2)	Pin (3)	Pull up and take out.
5. Bracket (2)	Toolbox (1)	Take off.
CLEANING		

NOTE

For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).

WARNING

Drycleaning solvent P-D-680 is toxic and flammable. Wear protective goggles and gloves and use only in a well ventilated area. Avoid contact with skin, eyes, and clothes and don't breathe vapors. Do not use near open flame or excessive heat. The flash point is 100°F to 138°F (38° to 59°C). If you become dizzy while using cleaning solvent, get fresh air immediately and get medical aid. If contact with eyes is made, wash your eyes with water and get medical aid immediately.

6.	Toolbox (1) and tray (4)	a. Using clean rags dampened in drycleaning solvent, wipe clean.
INSPECTION		

NOTE

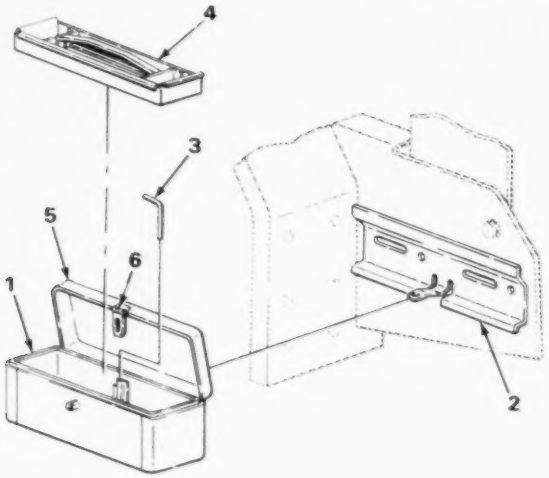
For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).

If any defective parts are found, notify Organizational Maintenance.

7.	All parts	Look for cracks, breaks and dents.
INSTALLATION		
8. Bracket (2)	Toolbox (1)	Place in position.
9. Toolbox (1) and bracket (2)	Pin (3)	Place in position.
10. Toolbox (1)	Tray (4)	Place in position.

TOOLBOX – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
INSTALLATION – CONTINUED		
11. Toolbox (1)	Toolbox cover (5)	Close.
12. Toolbox cover (5)	Latch (6)	Push down.



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Section XI. FIRE FIGHTING EQUIPMENT COMPONENTS

Page

Fire Extinguisher..... 3-70

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FIRE EXTINGUISHER

This task covers:

a. Removal (page 3-70)
b. Cleaning (page 3-70)
c. Inspection (page 3-70)
d. Installation (page 3-71)

INITIAL SETUP

Materials/Parts

Rags, wiping (item 7, appendix D)
Detergent, GP (item 1, appendix D)

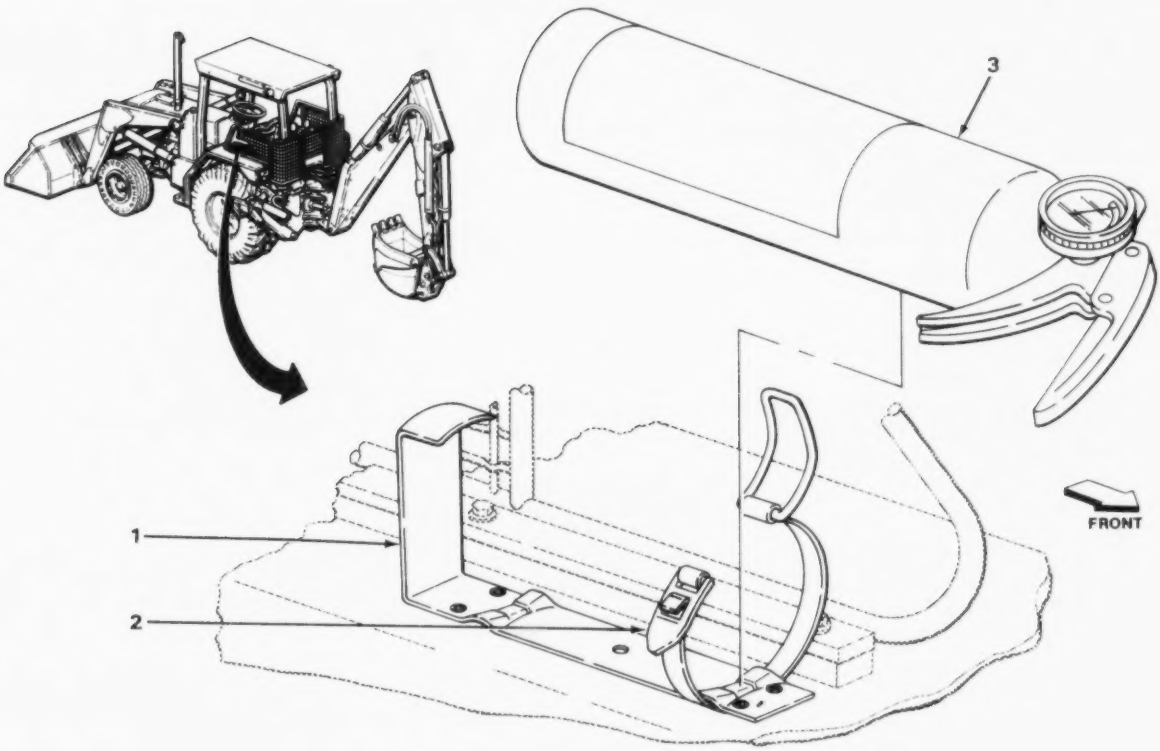
Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS
REMOVAL			
1. Bracket (1)	Clamp (2)	Unlatch.	
2.	Fire extinguisher (3)	Take off.	
CLEANING			
	NOTE		
	For more information on how to clean parts, go to General Maintenance Instructions (page 3-15).		
3.	Fire extinguisher (3)	a. Using clean rags, soap, and water, wipe clean. b. Using clean water, rinse. c. Using clean, dry rags, wipe dry.	
INSPECTION			
	NOTE		
	For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).		
	If any parts are defective, notify Organizational Maintenance.		
4.	Fire extinguisher (3)	Look for proper pressure (TB 5-4200-200-10).	

FIRE EXTINGUISHER – CONTINUED

LOCATION	ITEM	ACTION / REMARKS
INSTALLATION		
5. Bracket (1)	Fire extinguisher (3)	Place in position with pressure gage facing up.
6.	Clamp (2)	Attach latch around fire extinguisher (3).



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TA234905

Section XII. PARTS PECULIAR

Page

Hydraulic Earth Auger Attachment..... 3-72 Hydraulic Impactor .....

HYDRAULIC EARTH AUGER ATTACHMENT

This task covers:

a. Cleaning (page 3-72)
b. Inspection (page 3-73)
c. Installation (page 3-73)
d. Removal (page 3-73)

INITIAL SETUP

Tools

Cleaner, steam, pressure jet (Organizational Maintenance)

Personnel Required

One

LOCATION	ITEM	ACTION	REMARKS

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instruction (page 3-15).

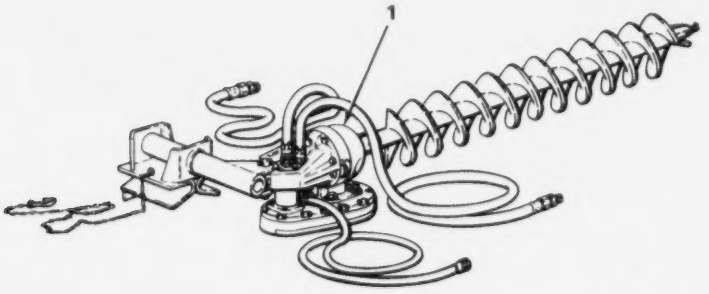
WARNING

Avoid contact with live steam. Life steam can burn skin, cause blindness, and caus other serious injury. Be sure to wear protective apron, gloves, and safety goggles whe using live steam.

1.		Auger (1)	Using pressure jet steam cleaner, cle

HYDRAULIC EARTH AUGER ATTACHMENT – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
INSPECTION		
	NOTE	
	For more information on how to inspect parts, go to General Maintenance Instructions (page 3-15).	
	If defective parts are found, notify Organizational Maintenance.	
2.	Auger (1)	Look for cracks, breaks, broken teeth, and leaks.
INSTALLATION		
3. Backhoe loader	Hydraulic earth auger attachment	Install (page 2-100).
REMOVAL		
4. Backhoe loader	Hydraulic earth auger attachment	Remove (page 2-104).



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HYDRAULIC IMPACTOR

This task covers:

a. Cleaning (page 3-74)
b. Inspection (page 3-74)
c. Installation (page 3-75)
d. Removal (page 3-75)

INITIAL SETUP

Tools	Personnel Required
Cleaner, steam, pressure jet (Organizational Maintenance)	One

LOCATION	ITEM	ACTION **REMARKS**

CLEANING

NOTE

For more information on how to clean parts, go to General Maintenance Instruction (page 3-15).

WARNING

Avoid contact with live steam. Life steam can burn skin, cause blindness, and caus other serious injury. Be sure to wear protective apron, gloves, and safety goggles whe using live steam.

1.	Impactor (1)	Using pressure jet steam cleaner, cle

INSPECTION

NOTE

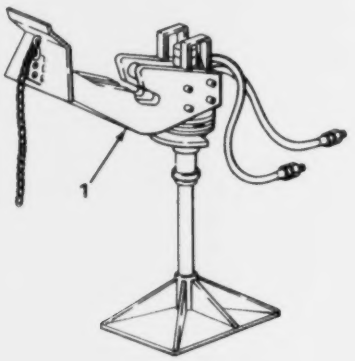
For more information on how to inspect parts, go to General Maintenance Instructior (page 3-15).

If defective parts are found, notify Organizational Maintenance.

2.	Impactor (1)	Look for cracks, breaks, and leaks.

HYDRAULIC IMPACTOR – CONTINUED

LOCATION	ITEM	ACTION **REMARKS**
INSTALLATION		
3. Backhoe loader	Hydraulic impactor	Install (page 2-107).
REMOVAL		
4. Backhoe loader	Hydraulic impactor	Remove (page 2-110).



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APPENDIX A

REFERENCES

PUBLICATION INDEXES

The following indexes should be consulted frequently for latest changes or revisions and for new publications relating to material covered in this technical manual.

Consolidated Index of Army Publications and Blank Forms	DA PAM 310-1

FORMS

Refer to DA PAM 738-750, The Army Maintenance Management Systems (TAMMS), for instructions on the use of maintenance forms pertaining to this equipment.

OTHER PUBLICATIONS

The following publications contain information pertinent to the major item of material and associated equipment.

Camouflage Pattern Painting	TC 5-200
Chemical, Biological, and Radiological (CBR) Decontamination	TM 3-220
Cooling Systems Tactical Vehicles	TM 750-254
First Aid for Soldiers	FM 21-11
Hand Portable Fire Extinguishers for Army Users	TB 5-4200-200-10
Lubrication Order for Loader Backhoe	LO 5-2420-222-12
Manual for the Wheeled Vehicle Driver	FM 21-305
Painting Instruction for Field Use	TM 43-0139
Printing, Camouflage Painting, and Marking of Army Material (Reprinted w/Basic Incl C1)	AR 750-58
Quarterly Equipment Improvement Report and Maintenance Digest	TB 43-0001-41

APPENDIX B

COMPONENTS OF END ITEM AND BASIC ISSUE ITEMS LIST

		Page
Section I.	Introduction	B-1
Section II.	Components of End Item	B-2
Section III.	Basic Issue Items	B-4

Section I. INTRODUCTION

SCOPE

This appendix lists components of end item and basic issue items for the loader backhoe to help you inventory items required for safe and efficient operation.

GENERAL

The Components of End Item and Basic Issue Items Lists are divided into the following sections:

Section II. Components of End Item. This listing is for informational purposes only, and is not authority to requisition replacements. These items are part of the end item, but are removed and separately packaged for transportation or shipment. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Illustrations are furnished to assist you in identifying the items.

Section III. Basic Issue Items (BII). These are the minimum essential items required to place the loader backhoe in operation, to operate it, and to perform emergency repairs. Although shipped separately packaged, BII must be with the loader backhoe during operation and whenever it is transferred between property accounts. The illustrations will assist you with hard to identify items. This manual is your authority to request/requisition replacement BII, based on TOE/MTOE authorization of the end item.

EXPLANATION OF COLUMNS

The following provides an explanation of columns found in the tabular listings:

Column (1) – Illustration Number (ILLUS NO.). This column indicates the number of the illustration in which the item is shown.

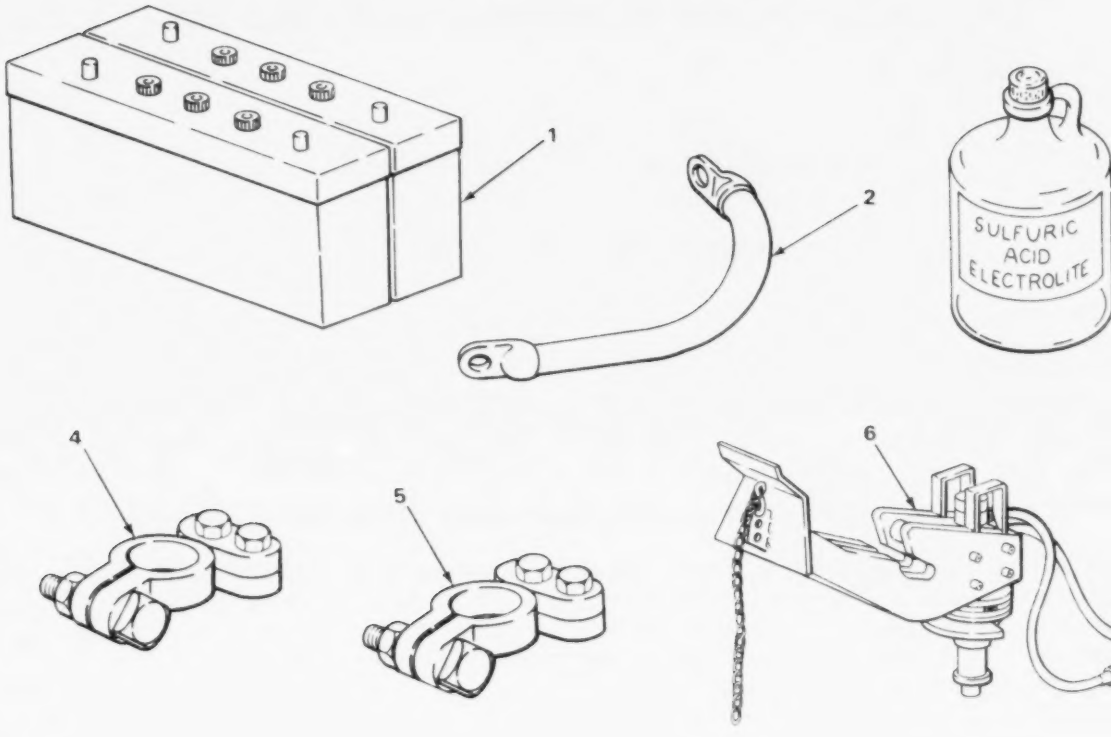
Column (2) – National Stock Number. Indicates the national stock number assigned to the item and will be used for requisitioning purposes.

Column (3) – Description. Indicates the federal item name and, if required, a minimum description to identify and locate the item. The last line for each item indicates the FSCM (in parenthesis) followed by the part number.

Column (4) – Unit of Measure (U/M). Indicates the measure used in performing the actual operational/maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr).

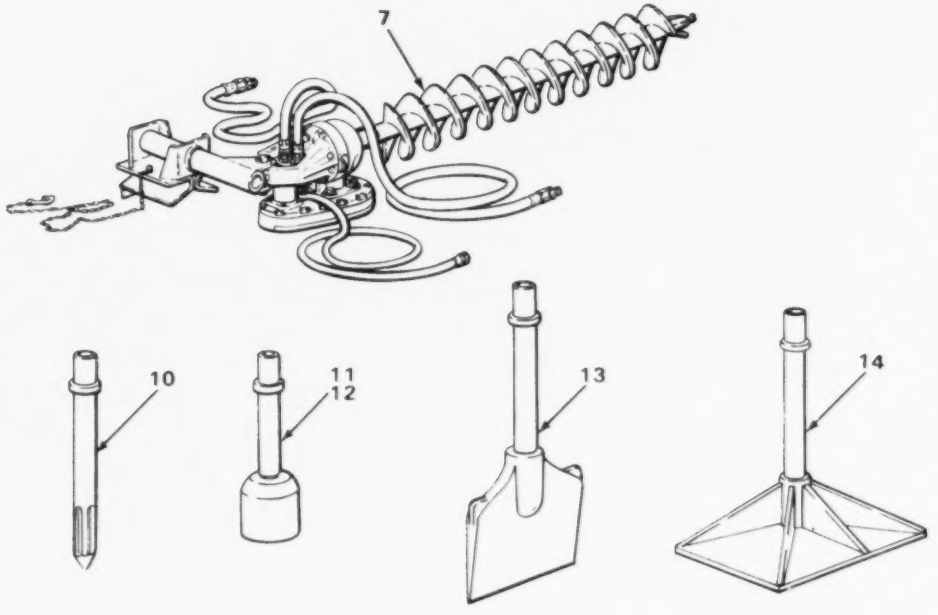
Column (5) – Quantity required (QTY RQD). Indicates the quantity of the item authorized to be used with/on the equipment.

SECTION II. COMPONENTS OF END ITEM



(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M
1	2910-01-128-0219	Battery, Storage, 6-Volt: (75160) AR45450		ea
2	6150-00-495-1242	Cable, Battery: (11083) 3R7773		ea
3	6810-00-249-9354	Sulfuric Acid, Electrolyte: (96906) MIL-STD-605		gl
4	5940-00-549-6581	Terminal Lug, Battery: (96906) MS75004-1		ea
5	5940-00-549-6583	Terminal Lug, Battery: (96906) MS75004-2		ea
6		Impactor, Hughes, Hydraulic: (75160) AA750		ea

SECTION II. COMPONENTS OF END ITEM – CONTINUED



(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQ'D
7		Hydraulic Earth Drill: (99984) Model 8200-5		ea	1
8		Breaker, 20° (0.35 rad): (74684) AF815		ea	1
9		Breaker, 30° (0.53 rad): (74684) AA105		ea	1
10		Relieved Moil: (74684) AA104		ea	1
11		Post Driver, 3-inch: (74684) AK794		ea	1
12		Post Driver, 4-inch: (74684) AK795		ea	1
13		Cutter: (74684) AT519		ea	1
14		Tamper: (74684) AK518		ea	1

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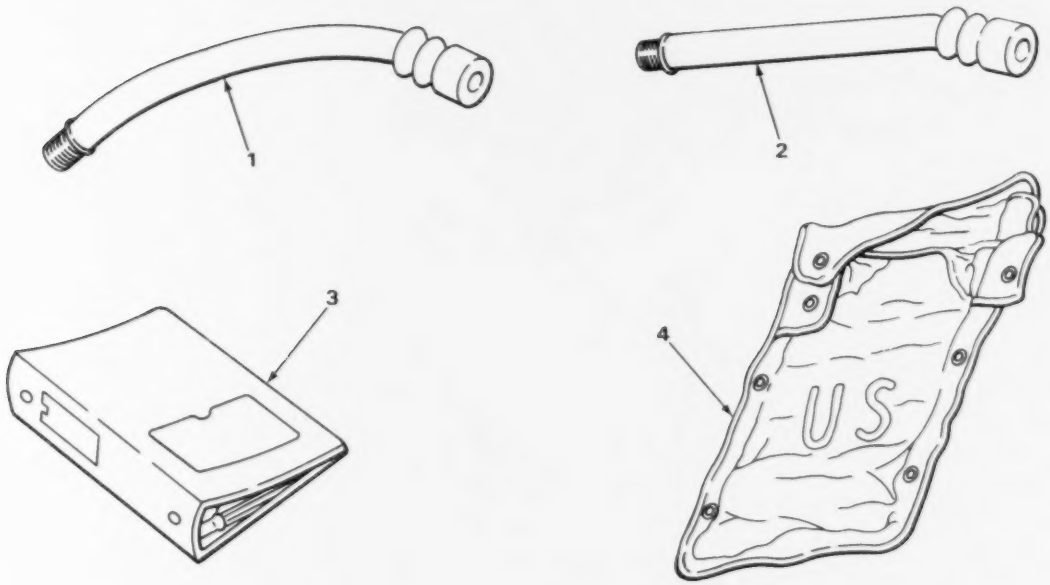
Section III. BASIC ISSUE ITEMS



(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQ'D
1	4930-00-288-1511	Adapter Grease Gun, Coupling, Flex: (81349) MIL-L-4387		ea	1
2	4930-00-204-2550	Adapter Grease Gun, Coupling, Rigid: (81349) MIL-L-4387		ea	1
3	7510-00-889-3494	Binder, Three-Ring, Logbook: (81349) MIL-B-43064		ea	1
4	7520-00-559-9618	Case, Cotton Duck: (81349) MIL-B-11743		ea	1

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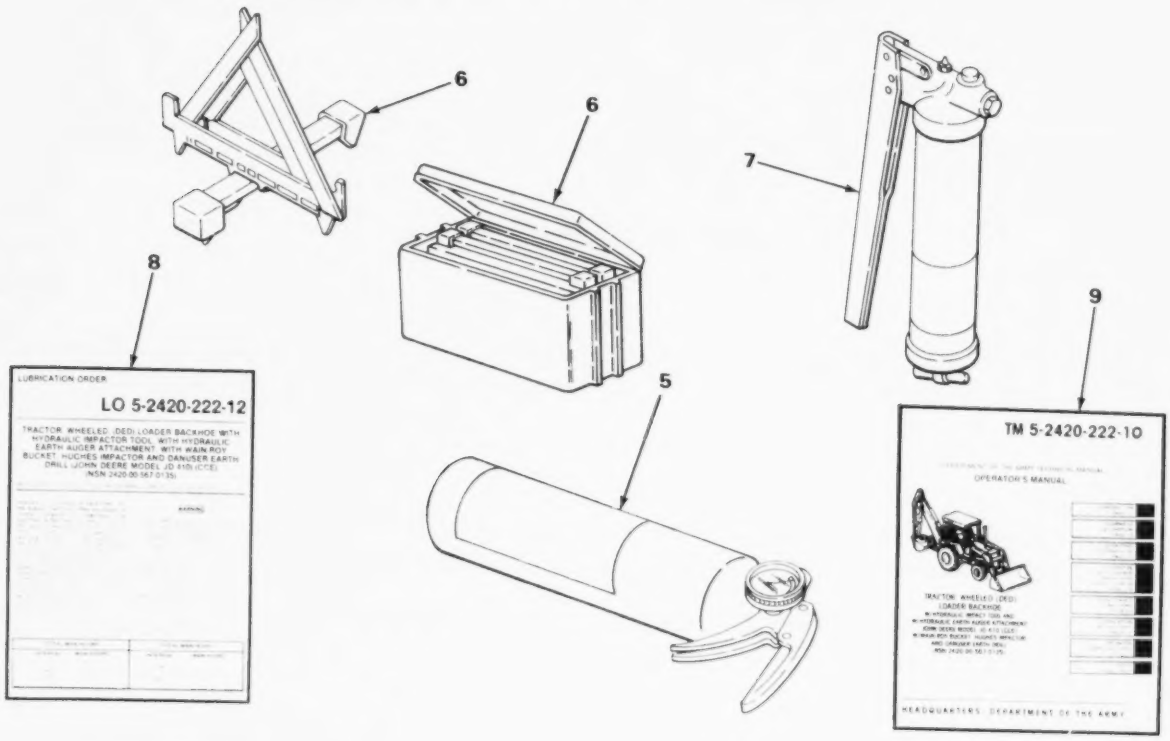
Section III. BASIC ISSUE ITEMS – CONTINUED



(1) ILLUS NO.	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION FSCM AND PART NUMBER	USABLE ON CODE	(4) U/M	(5) QTY REQ'D
5	4210-00-889-2221	Extinguisher, Fire, Dry Chemical: (16236) CS4210-0009CEFN		ea	1
6	9909-00-565-6267	Kit, Sign, Vehicle: (81337) 6-1-2248		ea	1
7	4930-00-253-2478	Lubricating Gun, Hand, 14 oz.: (11083) 8F9866		ea	1
8		Lubrication Order (LO 5-2420-222-12)		ea	1
9		Technical Manual (TM 5-2420-222-10)		ea	1

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APPENDIX D

EXPENDABLE SUPPLIES AND MATERIALS LIST

		Page
Section I.	Introduction	D-1
Section II.	Expendable Supplies and Materials List	D-2

Section I. INTRODUCTION

SCOPE

This appendix lists expendable supplies and materials you will need to operate and maintain the loader backhoe. These items are authorized to you by CTA 50-970, Expendable Items (except Medical, Class V, Repair Parts, and Heraldic Items).

EXPLANATION OF COLUMNS

Column (1) – Item Number. This number is assigned to the entry in the listing and is referenced in the narrative instructions to identify the material (e.g., "Solvent, drycleaning (item 4, appendix D").

Column (2) – Level. This column identifies the lowest level of maintenance that requires the listed item.

C – Operator/Crew
O – Organizational Maintenance

Column (3) – National Stock Number. This is the national stock number assigned to the item. Use it to request or requisition the item.

Column (4) – Description. Indicates the federal item name and, if required, a description to identify the item. The last line for each item indicates the Federal Supply Code for Manufacturer (FSCM) in parenthesis followed by the part number.

Column (5) – Unit of Measure (U/M). Indicates the measure used in performing the actual maintenance function. This measure is expressed by a two-character alphabetical abbreviation (e.g., ea, in., pr). If the unit of measure differs from the unit of issue, requisition the lowest unit of issue that will satisfy your requirements.

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION (FSCM)	(5) U/M
1	C	7930-00-282-9699	Detergent, GP, Liq, WS, A 1-gal (3.785-liter) can: (81349) MIL-D-16791	gl
2			Diesel Fuel	
	C	9140-00-286-5294	Regular Grade: (81348) VVF800GRADEDF2RE	
	C	9140-00-286-5286	Winter Grade: (81348) VVF800GRADEDF1WI	
	C	9140-00-286-5283	Arctic Grade: (81348) VVF800GRADEDFAAR	
3	C	6810-00-107-1510	Distilled Water, ACS 1 5-gal (18.925-liter) bottle: (81348) O-C-265	gl
4	C		Fluid, Hydraulic, Petroleum Base: (OHT) (58563) IMP-HDC-1-B	
	C	9150-00-090-5753	5-gal Container	gl
	O	9150-00-090-5754	55-gal Drum	gl
5			Grease, Automotive and Artillery (GAA): (81349) MIL-G-10924	
	C	9150-00-190-0905	5-lb can	lb
	O	9150-00-190-0907	35-lb can	lb
6			Oil, Lubricating, Internal Combustion Engine:	
			OE/HDO/10: (81349) MIL-L-2104	
	C	9150-00-186-6668	5-gal Container	gl
	O	9150-00-265-9429	55-gal Drum	gl
			OE/HDO/30: (81349) MIL-L-2104	
	C	9150-00-188-9858	5-gal Container	gl
	O	9150-00-188-9859	55-gal Drum	gl
			OEA, ARCTIC: (81349) MIL-L-46167	
	C	9150-00-402-2372	5-gal Container	gl
	O	9150-00-491-7197	55-gal Drum	gl

Section II. EXPENDABLE SUPPLIES AND MATERIALS LIST – CONTINUED

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) DESCRIPTION (FSCM)	(5) U/M
7	C	7920-00-205-1711	Rags, Wiping, 50-lb (22.7 kg) bale: (58536) A-A-531	bl
8	C	6810-00-264-6618	Sodium, Bicarbonate (Soda): (81348) O-S-576	lb
9			Solvent, Drycleaning, Type II: (81348) P-D-680	
	C	6850-00-664-5685	1-qt (0.946-liter) can	qt
	C	6850-00-281-1985	1-gal (3.785-liter) can	gl
	O	6850-00-285-8011	55-gal (208-liter) drum	gl
10	C	7510-00-266-6710	Tape, Pressure Sensitive: (96906) MS16698-73	yd

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By Order of the Secretary of the Army:

JOHN A. WICKHAM, JR.
General, United States Army
Chief of Staff

Official:

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Brigadier General, United States Army
The Adjutant General

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IN THIS SPACE TELL WHAT IS WRONG AND WHAT SHOULD BE DONE ABOUT IT:

Key 4 reads short jaw bucket pedal closes Wain-Roy jaw bucket.
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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter=10 Millimeters=0.01 Meters=0.3937 Inches
1 Meter=100 Centimeters=1000 Millimeters=39.37 Inches
1 Kilometer=1000 Meters=0.621 Miles

WEIGHTS

1 Gram=0.001 Kilograms=1000 Milligrams=0.035 Ounces
1 Kilogram=1000 Grams=2.2 Lb
1 Metric Ton=1000 Kilograms=1 Megagram=1.1 Short Tons

LIQUID MEASURE

1 Milliliter=0.001 Liters=0.0338 Fluid Ounces
1 Liter=1000 Milliliters=33.82 Fluid Ounces

SQUARE MEASURE

1 Sq Centimeter=100 Sq Millimeters=0.155 Sq Inches
1 Sq Meter=10,000 Sq Centimeters=10.76 Sq Feet
1 Sq Kilometer=1,000,000 Sq Meters=0.0386 Sq Miles

CUBIC MEASURE

1 Cu Centimeter=1000 Cu Millimeters=0.06 Cu Inches
1 Cu Meter=1,000,000 Cu Centimeters=35.31 Cu Feet

TEMPERATURE

5/9 (°F − 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 C° +32=F°

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	5.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.385
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621

(FOR REFERENCE ONLY)

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